KUOPION YLIOPISTON JULKAISUJA E. YHTEISKUNTATIETEET 163
KUOPIO UNIVERSITY PUBLICATIONS E. SOCIAL SCIENCES 163

HEIKKI PAAKKONEN

The Contemporary and Future Clinical Skills of Emergency Department Nurses

Experts' Perceptions Using Delphi- Technique

Doctoral dissertation

To be presented by permission of the Faculty of Social Sciences of the University of Kuopio for public examination in Auditorium L2, Canthia building, University of Kuopio, on Saturday 13th December 2008, at 12 noon

Department of Nursing Science
University of Kuopio

KUOPION YLIOPISTO

KUOPIO 2008

Distributor: Kuopio University Library
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FI-70211 KUOPIO
FINLAND
Tel. +358 17 163 430
Fax +358 17 163 410
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ISBN 978-951-27-1222-9
ISBN 978-951-27-1073-7 (PDF)
ISSN 1235-0494

Kopijyvä
Kuopio 2008
Finland

Paakkonen, Heikki. The contemporary and future clinical skills of emergency department nurses. Experts' perceptions using Delphi- technique. Kuopio University Publications E. Social Sciences 163. 2008. 210 p.
ISBN 978-951-27-1222-9
ISBN 978-951-27-1073-7 (PDF)
ISSN 1235-0494

ABSTRACT

Background of the study: Emergency Departments (ED) worldwide are facing a growing challenge in proportion to the numbers of ED patients, and the fact that the numbers of beds available treatment is not increasing in the same proportion. EDs are in danger of overcrowding more seriously and more often. The majority of the workforce in EDs consists of nurses, whose vocational training is aimed at the competence of a generalist nurse, but the work seems to require specialised skills.

Purposes and design of the study: The purpose of the study was to reveal and describe, and anticipate the future operational and educational requirements with special reference to ED nurses' clinical skills. The study belongs to the domain of clinical nursing science, and was conducted using the Delphi- technique as follows: the 1st round by semistructured interviews (N=34); the 2nd round by a mailed survey (N=208); the 3rd round by the work of a Delphi- panel (N=35); and the 4th round by the work of a review panel (N=4). The time span was set to culminate at the year 2020. The study questions were: I) What kinds of clinical skills are currently required from ED nurses? II) At what level are the clinical skills of ED nurses currently? III) What will the operational environment for future ED nurses be like? And IV) What kinds of clinical skills will be required from ED nurses in 2020? Experts were selected by purposive sampling techniques among stakeholders, so that all major areas of expertise, as well as interest groups (ED nurses, nursing managers, the medical leadership of EDs, emergency MDs, administrators, researchers, teachers), would be covered. Methodological triangulation in sequential form was applied. Qualitative deductive content analysis was used for the qualitative data, and descriptive statistical methods were applied for the quantitative data. Factor analysis was used to compress the quantitative data.

Results: A figure named 'Skills for wise risk management' was assembled to describe the current requirements for the clinical skills of ED nurses. The figure consists of three main components: Basic skills of a nurse; Basic skills of an ED nurse; and, Advanced skills of an ED nurse. The very core of ED nurses' professional competence was related to their skills in controlling both the clinical situation of each patient and the overall situation in the ED. A need for improvement of clinical skills was discovered especially in clinical patient assessment, pain management, co-operation with pre-hospital Emergency Medical Service, management of theoretical knowledge with special reference to knowledge of the natural sciences, and the detection of as well as reaction to problems related to disturbances of vital functions. In particular, MDs evaluated the quality of ED nurses' clinical skills significantly more critically than other respondents. The most important tasks that should be considered to be transferred to the responsibilities of ED nurses turned out to be ordering of laboratory tests and x-ray studies according to their own judgement, suturation of minor wounds, pain management, triage of inflowing patients, and care of a lifeless patient according to protocols. Centralisation of emergency health care services will continue, and this will place further demands on the clinical skills of ED nurses. Nurses' training was unanimously regarded as excessively theoretical at the cost of clinical competence, and a clear wish for this to be changed was evident. The operational environment of EDs in the year 2020 was considered likely to be similar to the current environment, but it was generally hoped that there would be a training programme dedicated solely to emergency nursing. The scope of ED nurses' practice was desired to expand, and this was also considered probable. Nurses' receptions within EDs of specialised medical care were considered both probable and desirable by 2020, as well as a limited right to prescribe and write certifications for sick-leave. Skills to perform appropriate patient triage will definitely be required. An increase in the procedures and care initiated by ED nurses independently was considered both probable and desirable.

Conclusions and implications: Nurses' theoretical and applied knowledge base should be strengthened, especially in terms of natural sciences including pathophysiology. Nurses' skills in reacting to clinical observations made as well as pain management ought to be developed. If it is considered appropriate to develop the scope of ED nurses' practice according to the findings of this study, the whole structure of nurses' education needs to be scrutinised critically. In particular, the current approach by way of aiming at the competence of a generalist nurse as well as the need to establish an official educational programme within the higher university degree of applied sciences in the field of acute nursing care will have to be reconsidered. Scientific research endeavour needs to be directed towards clinical emergency nursing, and an evaluation of the actual clinical skills of ED nurses would be of utmost importance. Furthermore, attention in terms of basic and applied research aiming at constructing universally applicable theory for emergency nursing might be beneficial for the whole discipline of nursing.

National Library of Medicine Classification: WY 154
Medical Subject Headings: Emergency Medical Services; Emergency Nursing; Education, Nursing; Professional Competence; Clinical Competence; Delphi-Technique; Personnel, Hospital; Risk Management; Patients

Paakkonen, Heikki. Päivystyspoliklinikkasairaanhoitajien kliiniset taidot nyt ja tulevaisuudessa. Asiantuntijoiden näkemykset Delfoi- tekniikalla. Kuopion yliopiston julkaisuja E. Yhteiskuntatieteet 163. 2008. 210 s.
ISBN 978-951-27-1222-9
ISBN 978-951-27-1073-7 (PDF)
ISSN 1235-0494

TIIVISTELMÄ

Tutkimuksen tausta: Päivystyspoliklinikat ovat maailmanlaajuisesti haasteellisessa tilanteessa. Potilasmäärät kasvavat, mutta jatkohoitopaikkojen määrä ei lisäänny potilasmääriä vastaavassa suhteessa. Vaarana on päivystysten nykyistä yleisempi ja vaikea-asteisempi ylikuormittuminen. Päivystyspoliklinikoiden henkilökunta koostuu pääasiassa sairaanhoitajista, joiden ammatillinen peruskoulutus tähtää lähinnä yleissairaanhoitajan pätevyyteen, mutta työ edellyttää pitkälle ulottuvaa erikoisosaamista.

Tutkimuksen tarkoitus ja tutkimusasetelma: Tarkoituksena oli paljastaa ja kuvata nykyisiä ja ennakoida tulevaisuuden toiminnallisia ja koulutuksellisia vaatimuksia, joita asettuu päivystyspoliklinikan sairaanhoitajille. Aikajänne olki asetettu vuoteen 2020. Tutkimus kuuluu kliinisen hoitotieteen alaan ja toteutettiin Delfoi-tekniikalla seuraavasti: 1. kierros toteutettiin puolistrukturoiduilla haastatteluilla (N=34); 2. kierros lomakekyselyllä (N=208); 3. kierros Delfoi- paneelin (N=35) työskentelyllä; ja 4. kierros arviointipaneelin (N=4) työskentelyllä. Aikaperspektiivi ulottui vuoteen 2020. Tutkimuskysymykset olivat: I Minkälaista kliinistä taitoa päivystyspoliklinikkasairaanhoitajalta vaaditaan tällä hetkellä? II Millä tasolla ovat kliiniset taidot nykyisin? III Minkälainen tulee päivystyspoliklinikan toimintaympäristö olemaan tulevaisuudessa? ja IV Minkälaisia kliinisiä taitoja tullaan vaatimaan tulevaisuudessa? Asiantuntijat valittiin tarkoituksenmukaisuusotannalla siten, että kaikki oleelliset sidosryhmät (päivystyspoliklinikan sairaanhoitajat, hoitotyön johto, päivystyspoliklinikoiden lääketieteellinen johto, akuuttilääketieteen asiantuntijat, hallinnon edustajat, tutkijat, opettajat) tulisivat kuulluiksi. Tutkimus toteutettiin jaksottaista triangulaatiota soveltaen. Laadullinen aineisto analysoitiin laadullisella sisällönanalyysillä ja määrällinen aineisto kuvailevilla tilastollisilla menetelmillä. Aineistoa tiivistettiin faktorianalyysin avulla.

Tulokset: Päivystyspoliklinikkasairaanhoitajan nykyisiä kliinisen taidon vaatimuksia kuvaamaan rakentui kuvio nimeltään ‘Taidot hallita riskejä viisaasti’. Kuvio koostui kolmesta pääkomponentista: Sairaanhoitajan perustaidot; Päivystyspoliklinikkasairaanhoitajan perustaidot; ja Päivystyspoliklinikkasairaanhoitajan pitemmälle kehittyneet taidot. Päivystyspoliklinikkasairaanhoitajan ammattitaidon ydin liittyi taitoihin hallita sekä yksittäisen potilaan riskejä että koko päivystyspoliklinikan tilannetta. Kliinisten taitojen kehittämistarvetta todettiin erityisesti seuraavilla alueilla: potilaan tutkiminen ja tilan arviointi, kivun hoito, yhteistyö ensihoitojärjestelmän kanssa, teoreettisen tiedon ja aivan erityisesti luonnontieteellisen tiedon hallinta sekä peruselintoimintoihin liittyvien ongelmien havaitseminen ja reagointi havaittuihin ongelmiin. Erityisesti lääkärikoulutuksen omaavat vastaajat arvioivat päivystyspoliklinikkasairaanhoitajien kliinisten taitojen laatua muita vastaajia merkitsevästi kriittisemmin. Tärkeimmiksi tehtäviksi, joiden siirtämistä osaksi päivystyspoliklinikkasairaanhoitajien toimenkuvaa tulisi harkita, osoittautuivat laboratorio- ja röntgentutkimusten tilaaminen oman harkinnan mukaan, pienten haavojen ompelu, kivun hoito, potilaslajittelun tekeminen ja elottoman potilaan hoito protokollan mukaisesti. Terveydenhuollon päivystysten keskittyminen jatkuu ja tämä asettaa kliinisille taidoille kasvavia vaatimuksia. Sairaanhoitajien koulutusta pidettiin lähes yksimielisesti liian teoreettisena kliinisen osaamisen kustannuksella, ja tähän toivottiin selkeää muutosta. Vuonna 2020 päivystyspoliklinikan toimintaympäristön arvioitiin olevan lähellä nykyistä, mutta päivystyspolikliinisen hoitotyön erityisosaamiseen tähtäävän koulutusohjelman kehittämistä toivottiin yleisesti. Päivystyspoliklinikkasairaanhoitajan toimenkuvaan toivottiin selkeästi lisää ulottuvuuksia sekä vastuuttamista ja tätä pidettiin myös todennäköisenä. Sairaanhoitajavastaanotot erikoissairaanhoidon päivystysten yhteydessä arvioitiin sekä todennäköisiksi että toivottaviksi vuonna 2020. Rajoitettu oikeus lääkkeen määräämiseen sekä sairauslomatodistusten kirjoittamiseen arvioitiin hyvin todennäköiseksi ja toivottavaksi. Taitoa luotettavan potilaslajittelun tekemiseen tullaan tarvitsemaan. Päivystyspoliklinikkasairaanhoitajan itsenäisesti suorittamien toimenpiteiden ja käynnistämien hoitojen arvioitiin ja myös toivottiin lisääntyvän.

Johtopäätökset ja sovellukset: Sairaanhoitajien teoreettista tietämystä tulee vahvistaa erityisesti luonnontieteellisten aineiden osalta. Sairaanhoitajien taitoa reagoida potilaista tehtyihin havaintoihin tulee kehittää samoin kuin päivystyspoliklinikan potilaiden kivun hoitoa. Jos päivystyspoliklinikkasairaanhoitajan toimenkuvaa katsotaan tarkoituksenmukaiseksi laajentaa tutkimustulosten suuntaisesti, joudutaan koko sairaanhoitajakoulutuksen rakennetta arvioimaan kriittisesti. Erityisesti nykyinen suuntaus kouluttaa yleissairaanhoitajia sekä tarve perustaa akuutin hoitotyön virallinen ammattikorkeakoulun jatkotutkintoon tähtäävä koulutusohjelma tulevat tarkasteltaviksi. Akuutin hoitotyön tieteellistä tutkimusta on tehostettava ja päivystyspoliklinikkasairaanhoitajien todellisten kliinisten taitojen arviointi olisi erittäin tärkeätä. Sekä perus- että soveltava tutkimus akuutin hoitotyön teorian kehittämiseksi saattaisi hyödyttää koko hoitotyön tieteenalaa.

Yleinen suomalainen asiasanasto (YSA): akuuttihoito; ensiapu; poliklinikat; sairaanhoitajat; osaaminen; koulutus; delfoimenetelmä; asiantuntijat; riskienhallinta; potilaat

ACKNOWLEDGMENTS

I don' t even dream about being able to thank all whom I am indebted to. However, Thank You All. As the old saying goes nobody does anything really important, remarkable and sustainable alone, just by himself. Everything that carries real importance and meaning is achieved in co-operation with others. This has most certainly been the case in this research process, too.

At the moment of completion of this research work I want to express my sincerest gratitude towards my supervisors professor Kerttu Tossavainen and Senior Medical Officer Tom Silfvast, PhD, for Your endless and hugely professional advice, guidance, encouragement and support. You have lent Your vast scientific knowledge and experience for my disposal again and again in a way that I can nothing but admire.

My cordial thanks are extended to the official reviewers director Elina Eriksson, PhD, Adjunct Professor, and Senior Researcher Fellow Julie Considine, PhD, for Your excellent work with the manuscript of the thesis. You have both provided me with invaluable comments, constructive criticism and heart-warming encouragement, which have illuminated numerous gloomy moments of disbelief. The author is deeply grateful to Osmo Kuusi, PhD, for his highly skilled and numerous beneficial comments and productive criticism as well as the review of the manuscript.

The author wishes to express his gratitude to statisticians Vesa Kiviniemi, Lic. Phil. and Esa Kokki, PhD. You have enabled me to maintain at least part of my mental health and well-being with Your kind and highly professional advice concerning the mysterious, but also so charming world of statistics. I gratefully acknowledge the cooperation of Professor Katri Vehviläinen-Julkunen and the whole staff of the department of nursing science of Kuopio university. Ms Maija Pellikka has helped me in so many ways, and Jari Kylmä, PhD, provided me with skilled and useful comments for improving and editing the manuscript. Tuula Väinämö saved me from a huge workload when taking care of the transcription of the interviews, for which I want to thank You.

My special appreciation is extended to the students as well as teachers of the Finnish Post-Graduate School in Nursing Science. Furthermore, all those, not so few, Finnish fire and rescue departments that have provided me with shelter and good company in relaxing atmosphere during my numerous visits during the years of postgraduate studies, are hereby

cordially praised.

I gratefully acknowledge the positive attitude and support of my employer, and especially the principal of the Emergency Services College, Reijo Tolppi, PhD, as well as the Researcher Director Hannu Rantanen, Lic. Phil, librarian Helena Ignatius and Ms Sirpa Manunen. Thank You so much for Your support and assistance in this project. The whole staff as well as the students of the college deserve my most humble appreciation. However, I will always be deeply indebted to personnel of the Unit of Emergency Medical Care Training, Sedis, Jokke, Kaitsu, Risto, Linkku, Raine, Hannu, Maukka, Pertti, Rane, Arska, Esa, Jönni, JiiPee, Minna, Marla, Simo, Lare, Alanen, Matilainen, Otto, and all the rest during so many years. Without Your paramedic and fireman humor the world, or at least mine, would have been a much more dull place. You have kept the wheels turning, while I have been away, physically or mentally or both. Keep up the good work!

This study has been economically supported by the Academy of Finland, the Foundation of Nurse Education, the Finnish Nurses Association, and the Research and Development Unit of the Emergency Services College. I want to express my gratitude to all the aforementioned for their support.

Special thanks are reserved for the nearest and dearest. My parents Mirjam and Toivo, and my sister Kirsi. Thank You for Your endless encouragement and support. I owe You more than I can ever pay back. Kirsi and Tomi, Juha and Johanna, Emmi and Mika, and Joni: thank You for letting me to enter your life and share it with You.

Mikko and Anna: You have been the pride and joy of my life from the first time ever I saw your face. You are always on my mind, you are always on my mind. Thank You for being just the way You are. Annahelmi and Sami: You have been cordially welcome to my life.

My sincerest appreciation goes to You, Tarja. So often You have helped me make it through the night, and, yes, I can see clearly now, the rain has gone. Your ability to crystal clear scientific thinking is nothing but enviable. Thank You for those invaluable moments with research issues, but also those without a trace of science. I have been very, very lucky.

Kuopio November 2008

Heikki Paakkonen

‘Ob sie nun schlecht oder gut ist, so ist die Zukunft doch das Eigene Werk des Menschen’

(Be it good or bad, the future is still the product of Man himself)

Olof Palme, Oberhaugen, Germany. 1972

List of abbreviations and terms

Abbreviation/term	Explanation
ACNP	Acute Care Nurse Practitioner
ACS	Acute Coronary Syndrome
ALS	Advance Life Support
AMI	Acute Myocardial Infarction
ATS	Australasian Triage Scale
AVS	Abnormal Vital Signs
BLS	Basic Life Support
CCU	Coronary Care Unit
CHD	Coronary Heart Disease
CINAHL	Cumulative Index of Nursing and Allied Health Literature
CPAP	Continuous Positive Airway Pressure
CPO	Cardiogenic Pulmonary Oedema
CPR	Cardiopulmonary Resuscitation
ECG	Electrocardiography
ED	Emergency Department
EMS	Emergency Medical Service
ENA	Emergency Nurses' Association
FP	Family Presence
ICN	International Council of Nurses
i.v.	intravenous
IUD	Intrauterine Device
KMO	Kaiser-Meyer-Olkin
MD	Medical Doctor
Mesh-term	Medical subject heading -term
MIU	Minor Injuries Unit
NIT	Nurse Initiated Thrombolysis
PTCA	Percutaneous Transcoronary Angioplasty
RN	Registered Nurse

STAKES	Sosiaali- ja terveysalan tutkimus- ja kehittämiskeskus (The National Research and Development Centre for Welfare and Health
UN	United Nations
UTI	Urinary Tract Infection
VAS	Visual Analogic Scale
WHO	World Health Organisation

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1 Background

Emergency nursing has not been a popular subject of scientific nursing research in Finland. This study aims at contributing to a revival both in the thinking of the scientific community within the domain of nursing science, and in the way research subjects are chosen. Clinical skills have hardly ever before been taken as subjects of domestic scientific nursing research, but competencies have been studied frequently both domestically and internationally (Zhang et al. 2001, Watson et al. 2002, Meretoja et al. 2003, Meretoja 2004, Mason et al. 2005, Gardner et al. 2006, Tuomi 2008, Andrew et al. 2008). The idea for this study stems from these underpinnings.

1.1 Definition of the concepts used for health care personnel and their actions

Due to the versatile international application of English concepts concerning certain health care personnel the following definitions will be used throughout the study. Emergency Department (ED) nurse (ED nurse) is any registered nurse working in an ED. Due to the lack of special educational program for ED nursing in Finland ED nurses' educational background may vary greatly including nurse-paramedics. Furthermore, official regulations defining the requirements for an ED nurse are lacking in Finland, as well. The prevailing situation might, in a more profound sense, indicate that ED nursing is not necessarily regarded as a genuine, independent domain of nursing profession when compared with e.g. the profession of a midwife, public health nurse, or a nurse anaesthetist.

Unit manager stands for the registered nurse in charge for the whole nursing personnel of the ED, and all the nursing actions taken in the ED, as well. Nursing director, in turn, means a registered nurse holding generally a higher university degree. They are in charge of the nursing personnel and actions of several units or departments. Nursing management is comprised of nursing directors and unit managers.

Emergency department nursing (ED nursing), in turn, stands for the nursing care provided by ED nurses in the circumstances of ED, while emergency nursing is the definition used to cover all patients' health-related incidents requiring immediate nursing actions regardless of the venue of the incident. Such an exception to the aforementioned is, however, allowed that incidents occurring outside hospital are responded by Emergency Medical Service (EMS) system activated by dispatch centres. Pre-hospital emergency care personnel, i.e. first

respondents, emergency medical technicians (EMT), fire-fighters, paramedics and emergency physicians serve as the operational body of EMS. Albeit this study deals merely with ED nursing it seems justified to include the previous definitions concerning EMS system and its operational bodies to these definitions.

Medical doctor (MD) is the definition used for a health care professional having completed the education of a physician. An emergency physician is a MD working in EMS and having obtained or aiming at obtaining a special competence in pre-hospital emergency medicine admitted by The Finnish Medical Association.

1.2 Evaluation of emergency health care services

Emergency health care services, a functionary provision of urgent and often irregular services, are an essential part of our health care system. Arrangement of these services provides both an economic and health care organisational challenge. The general public economy has driven the organisations responsible for the arrangement of emergency health care services to seek for alternative methods in order to enhance efficiency. On the other hand, the technological development of health care would for various reasons require even larger population bases. These factors separately and together plead for even more clearly centralised system of emergency health care services. (Linna and Kekomäki 1993). According to a consensus statement of the Finnish Medical Society Duodecim and the Finnish Academy, centralisation in health care traditionally means that by modifying the prevailing functional model, by mutual agreements or by giving instructions and orders, certain diagnostic services, certain methods of care or rehabilitation, are gathered into fewer units within the state (Duodecim and Finnish Academy 2003).

Another at least as important reason for the centralisation of emergency health care services is the aspiration to ensure adequate and sufficient competence of those providing care for acutely ill and injured patients. In the emergency departments, important medical, but also economic decisions are continuously made, and mistakes may turn out to be expensive in both meanings (Lehtonen 2001).

The evolution of Finnish society has led to a situation where the municipalities have, mainly in the pressure of tight public economics, had to seek new solutions for the problem of organising the emergency health care services. It has been stated that the annual increase in peoples' health care needs will be 5% and the increase of public economic resources will be

2.5%, so the central challenge for health care will more and more critically be the optimal exploitation of public economic resources (Karpakka 2001). It is an everyday routine to provide co-operation between primary health and specialised medical care in terms of organising emergency health care services during night-times and weekends (Lehtonen 2001). This trend, together with the centralisation of health care units, will probably continue in order to relieve the strain on the physicians responsible for the on-call duties and thus provide more resources for the day-time services based on appointments (Punnonen 2001). On the other hand, evidence has been gathering that especially accidents needing immediate treatment as on-call work will occur more often per person in densely populated urban areas than in the more thinly populated rural areas (Lehtonen 2001). The population bases for small and medium-sized hospital districts are not large enough for maintaining competence within medical sub-specialisms, so several hospital districts are forced into co-operation (Punnonen 2001, Ministry of Social Affairs and Health 2002).

From the viewpoint of achieving a sensible solution for organising the emergency health care services during out-of-office hours, there exists two contradictory objectives: availability of sufficient health care services and minimising the costs of these services (Linna and Kekomäki 1993). The objective of minimising the costs of these services is unambiguous, but in order to define the sufficiency or availability of services requires defining the concept of sufficiency. An unambiguous definition of the sufficiency of emergency health care services has not been carried out in Finland. The situation can be compared to the Emergency Services Act passed by the United States' Congress, where unambiguous standards for the availability of the services are set. According to the law there, 95% of all those in need of emergency health care services must be reached within 10 minutes in urban areas and within 30 minutes in rural areas (Baker and Clayton 1989). Even though the EMS Act makes demands especially on the out-of-hospital emergency medical care system, it also functions as an indication of willingness and real possibility to define the availability of emergency health care services.

Because in Finland we do not have unambiguous regulations concerning the availability of emergency health care services, it seems reasonable to assume, as a natural continuum of the evolution of progress, that a realisation of the situation has already emerged: increasingly, health care units will be responsible for the emergency health care services during out-of-office hours for larger areas and bigger populations. This evolution may respectively put more

and more emphasis on the first three components of emergency health care services – the dispatch centres, pre-hospital emergency medical care system (EMS), and the EDs of hospitals.

The joint, state-owned and government-funded dispatch centres are already having an influence on the demands on emergency health care services by guiding the callers to appropriate utilisation of health care services. This is also the way in which the EMS works either by providing appropriate treatment to the patient on the spot and thus avoiding a visit to the ED, or by giving adequate guidance to the patient for e.g. utilising the services of local health care centres by appointment (Castrén 2004). The impact of these actions concerning the ability to restrain the growth of demand on emergency health care services can be described as remarkable. In 2005, Helsinki EMS alone completed a total of 36,882 emergency missions. In 35.8% of these cases, patients' transportation to a health care facility was avoided by professional EMS care on the spot. Even though these figures include the patients who were declared dead on the scene, it is reasonable to assume that a considerable proportion of ED visits, and hence worsening of the congestion in the EDs of Helsinki were avoided (The City of Helsinki Rescue Department 2005). Nevertheless, despite these obviously useful impacts the safety of this policy has recently been challenged (Cooke 2006). However, by means of sensible patient guidance and well-functioning day-time reception of patients it has turned out to be possible to reduce the burden on the health care staff responsible for the on-call duties (Nissinen-Paatsamala 2002).

All in all, the usefulness and rationality of centralisation of health care services remains, to say the least, controversial. Within specialised medical care, the interpretation of research findings in terms of the optimal size of a health care unit is complex (Linna et al. 2006). Better patient outcomes have shown to be related to higher volumes across medical and surgical specialties, even though the relationship between hospital volume and physician experience with various conditions or procedures is not necessarily linear. On the other hand, factors connected to the very core of emergency medical practice may limit the ability to apply these findings unreservedly to other fields of medical practice (Chase and Hollander 2006.) However, some evidence, provided that the availability, feasibility and regional covering of pre-hospital EMSs are safeguarded, has been demonstrated in favour of the reasonability of centralisation of emergency health care services (Duodecim and Finnish Academia 2003, Hujanen 2006). Schull et al. (2006) have recently demonstrated lower-

volume EDs as having up to two-fold higher odds of missed acute myocardial infarctions compared with highest-volume ones when patient factors had been controlled for (Schull et al. 2006). With good reason it can be presented that a well-functioning ED can save, and an ill-functioning ED can increase, expenditure of medical care (Pohjola-Sintonen and Varpula 2006). It is both a domestic and an international observation that ED visits are increasing continuously, and the peaks of patient congestion are higher than previously experienced. The general public and media have shown a growing interest in the emergency health care services (Velianoff 2002, Kellermann 2006, Pohjola-Sintonen and Varpula 2006). These issues seem to be discrete, and the constant the risk of generating more heat than light in the discussions around these topics may be hard to avoid.

Figure 1 aspires to demonstrate the complexity of evaluating the outcomes of care, which should, however, be at least one criterion used when assessing the impacts of centralisation of health care services:

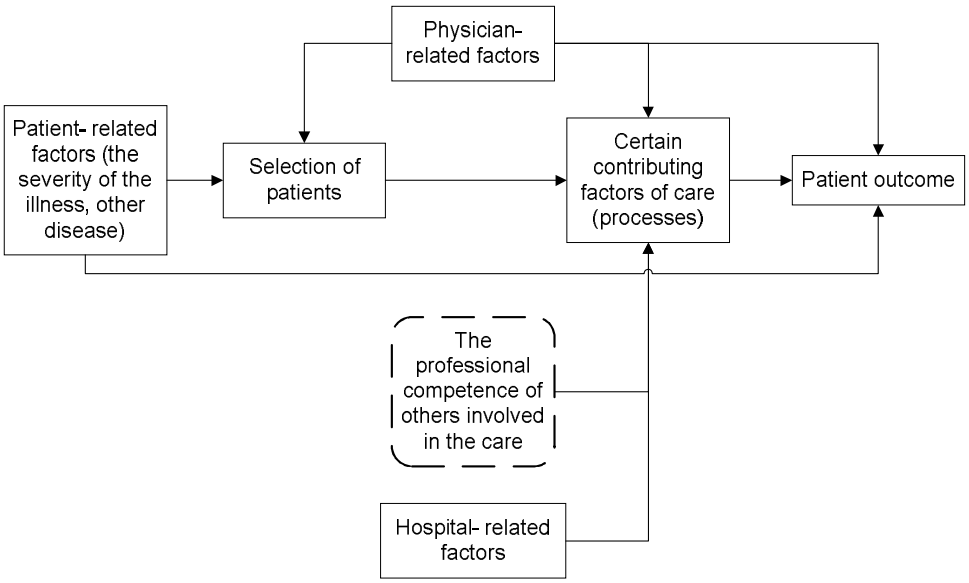

FIGURE 1. A model of outcome-related factors of care (modified by the researcher from: Finnish Academy & Duodecim 2003).

1.3 Definition of the urgency of care

The main purpose for the existence of EDs is to provide immediate assessment and triage for patients in the need of urgent care (see Spiteri 2008). This phase in the continuum of care is in the focus of this study. In 2001 the Government set up a National Health Care Project in order to safeguard the future of Finnish health care. The purpose of the project was to prepare a plan and implementation programme for safeguarding the functioning of health care as well as availability and quality of health care services. The aim of the work described in this development plan is to guarantee, in the way the Law of constitution regulates, the availability of health care services for all citizens according to their needs. The results of the project were released in 2002. With reference to them such a suggestion is made that, in other than emergency situations, access to care within prescribed periods of time should be guaranteed by 2005. By that year all such care and treatment that is deemed necessary had to be provided within six months. An estimation of out-patient treatment within specialised medical care should be guaranteed to take place within three weeks and a first estimate of need for treatment at a health centre within three days from the date the client has contacted the centre. In the report it is also mentioned that an urgent care must be provided without delay (Ministry of Social Affairs and Health 2002). The concepts of urgency and without delay are, however, not formally defined and therefore they are left to the understanding or opinion mainly of the persons who are themselves in need of care, the dispatch centres, the representatives of EMSs, and individual MDs responsible for on-call duties. A possible definition for urgency of care can be regarded as a situation where the adequate care should be set into action within 24 hours from the appearance of the need of care (Voipio-Pulkki 2005).

1.4 Emergency department visits – figures and causes

Both domestic and international statistics indicate that the volumes of ED activities are, to say the least, considerable. Within the hospital district of Helsinki and Uusimaa there were 205,034 ED visits in 2004. The busiest time, in terms of the numbers of patients entering EDs, was between 10 a.m. and 3 p.m. The median through-flow time was seven hours. Thus the actual peaks of congestion turn out to be approximately from 3 p.m. to 10 p.m. The annual degree of utilisation of almost all acute care hospitals was high, even exceeding 100%. On the other hand, as the annual utilisation degree of acute care hospitals exceeds 85%, the resultant inconveniences put a pressure on the ED and also raise the total costs of the activities

(Pohjola-Sintonen and Varpula 2006). The care of urgent and ED patients consumes 75% of all the funds available for specialised medical care, and according to a report prepared in the Turku university central hospital, the running of all the emergency and out-of-hours services of a university hospital accounts for 40% of total hospital expenditure (Teittinen 2005).

The total of the Finnish population and its distribution by age and gender, and the percentage share of the population living in urban areas are demonstrated in order to place the phenomena in the focus of this research into a quantitative framework (Appendix 1). It is probably not an exaggeration to claim that these are valid attributes through which to characterise certain features of the daily work of ED nurses. Even though the annual causes of death may not have a linear relation to the ED load, it seems reasonable to assume that a loose connection might be possible. Thus, the causes of death in 1990, 1995 and 2004 are presented in Appendix 2.

All the following data are gathered from the registries of STAKES concerning somatic specialised medical care during 1997 – 2004 (STAKES 2005). The data aspire to illustrate, more detailed, the nature and quantity of ED patient material and thus shedding light on the characteristics of ED nurses' work. It is noteworthy that the concept of *treatment episode,* according to STAKES (2006a) means the amount of treatment episodes that have ended during the year under examination. Respectively, the concept of *urgent admission percentage* tells, of all the treatment episodes, the percentage share of those treatment episodes, for which the patient has entered the hospital unscheduled and most usually via the ED. The figures of urgent admissions (Appendix 3) certainly include patient transfers from other health care facilities, so that the patients have not received any actual treatment in the ED. However, according to the researcher' s clinical experience, it is fairly likely to be in the patients' best interest that the triage- nurse also assesses these patients in the event that on occasion immediate life-saving action has to be started. According to the aforementioned rationale, in 2004 as a whole, 1,026,618 treatment episodes took place, and 42% of them were urgent admissions. Almost 900,000 ED visits were made in 2004 (Table 1).

TABLE 1. All ED visits in 2004 by hospital type, possible psychiatric ED visits included, but unscheduled visits to psychiatric hospitals excluded, frequencies. STAKES 2005.

Hospital type	ED visits, frequencies
Helsinki University Hospital (all EDs)	121,729
Turku University Hospital	53,307
Kuopio University Hospital	34,493
Oulu University Hospital	39,385
Tampere University Hospital	52,317
Central Hospitals (n = 15) altogether	358,039
District Hospitals (n = 20) altogether	220,335
Total	**879,605**

Gastrointestinal tract symptoms represented the most common main diagnosis of ED visits in 2004 (Appendix 5). Surgery and internal medicine were clearly the most frequently needed medical specialisms (Appendix 6, Table 1). Surgery and neurosurgery together represented a 36% share, and internal medicine a 31% share among the ten most frequently needed medical specialisms (Appendix 6, Figure 1). Distribution of ED visits by age in 2004 was as follows (Table 2):

TABLE 2. ED visits in 2004 classified by age and frequency. STAKES 2005.

Age, years	ED visits, frequencies
0 – 14	101,882
15 – 64	539,689
65 – 74	104,062
75+	143,648

Schultz (2003) presents some prevailing facts from the USA as follows: 1) Nearly 55% of hospital stays of the very old (80 years and older) start in the ED; 2) 45% of the hospital stays

of younger age groups start in the ED; 3) More than one third of all hospital admissions are through the ED; 4) Over 50% of all hospitalised patients have at least one co-morbidity, and another 33% of patients have two or more co-morbid factors; 5) Drug abuse, psychoses and depression are present as the top 10 co-morbidities for adolescents and adults up to age 44; 6) Alcohol abuse is a principal co-morbidity for adults aged 18 to 44.

The current number of annual ED visits exceeds 114 million, representing more than 10% of all outpatient encounters in the USA. A report of the Agency for Healthcare Research and Quality presents that in 2003, 55% of community hospital admissions (maternal and neonatal conditions excluded) began in the ED (Kellermann 2006). Moreover, Bible (2006) refers to a report of The Audit Commission in the UK from 2001, when stating that more than 15 million people attend EDs in England and Wales annually (Bible 2006).

1.5 Emergency departments as part of specialised medical care

With reference to Voipio-Pulkki (2005), the starting points for the Finnish health care system are financing by taxes, the responsibility for organising resting on the municipalities, and patient's rights being laid down by law. The maintenance of comprehensive preparedness for the need for urgent care goes back to the law of constitution, and several other laws, which place the municipalities under the obligation of arranging urgent care for those in need of it. In Finland there are 21 hospital districts for the arrangement of specialised medical care as require by law (The Act of Specialised Medical Care 1989 / 1062). The primary provider of care is the local health centre. Should it turn out to be impossible to respond to the patient' s health care needs there, the patient must be guided to specialised medical care. This system is applied also to those in urgent need of care. The emergency departments (ED) for specialised medical care are, in first instance, obeying a policy, according to which referrals are required. This is, however, not applied to patients in need of emergency medical care.

The primary justification for the existence of EDs is the aspiration to combat acute threat to a person' s life and health. Thus, at the core of that mission are simultaneously competence of the highest quality, good management of processes, and high-quality professional ethics (Voipio-Pulkki 2005) Patients arriving at the ED present with a spectrum of illnesses and injuries and with remarkable variation in the severity of their clinical state. Even severely ill and injured patients may arrive with little or no warning, which poses a challenge to the receiving health care personnel to have the confidence and competence to commence prompt

and effective life-saving treatment (Sutcliffe 1992). Emergency departments, as well as pre-hospital emergency medical care system, both serve as entry points to the emergency health care system and work together to ensure optimal patient care (Gluckman et al. 2006). Thus, EDs can be seen as one point in the continuum of the care already begun in the pre-hospital phase prior to the next phases that are required according to the patients' needs.

1.6 Emergency department nursing

The next longish illustration of some characteristics of ED nurses' work is borrowed from Schriver et al. (2003) because of its appropriateness, and is presented as follows: 1) There are no limits to ED's clinical patient load, especially in the university, central and district hospitals; 2) Its' patients are from both sexes and represent all age groups (with some solitary exceptions); 3) Patients present with virtually all diseases (either undiagnosed or in acute phase of their natural history); 4) Patient diagnosis and treatment is unscheduled; 5) All ED personnel perform their professional responsibilities in each others' constant presence; 6) The performances are observed by a variety of other persons with reason to be present - patient's family and other relatives, fire-fighters, paramedics, and police, to name a few; 7) In the centre of this environment ED nurses play an essential role, spending more time with the patients than other ED personnel, including physicians; 8) Increasingly, ED nurses, as well as physicians, spend more than half of their clinical time on indirect patient care tasks; 9) The nursing assessment of ED patients demands advanced skills, as does ongoing patient monitoring; 10) Nursing documentation is ongoing, requiring computer entry skills; 11) None of the nursing educational pathways adequately prepare the emergency nurse for clinical practice; 12) The emergency nursing practice is continuously becoming more complex, requiring more formal and longer orientation periods for those newly recruited; 13) A worldwide shortage of nurses is predicted by 2010, and a severe shortage by 2020; 14) In this ever-changing world, one thing that is not changing is the expectation by patients and their families that their emergency nurses will be caring, supportive and informative caregivers, who value the patients as individuals. As mentioned previously, it most likely is futile to even attempt to deny any of these characterisations when considering the work of Finnish ED nurses.

The purpose of all nursing is to support human beings' own resources in order to enable their recovery from the emergency that has afflicted them (MacPhall 1992, Ministry of Education 2006). Within the ED, the primary aims of ED nursing are the assessment of patient' s need of

care, establishing a working hypothesis, adequate response according to the patient' s needs, and outlining the need for continuing treatment. (Koponen and Sillanpää 2005.) These aims are commonly pursued conforming to the following scheme: triage - primary assessment - resuscitation or immediate care - secondary assessment - focused assessment - diagnostic procedures or data - setting a diagnosis - transfer to continued treatment or home (Twedell 2000). A typical clinical workflow of an ED is described in Figure 2.

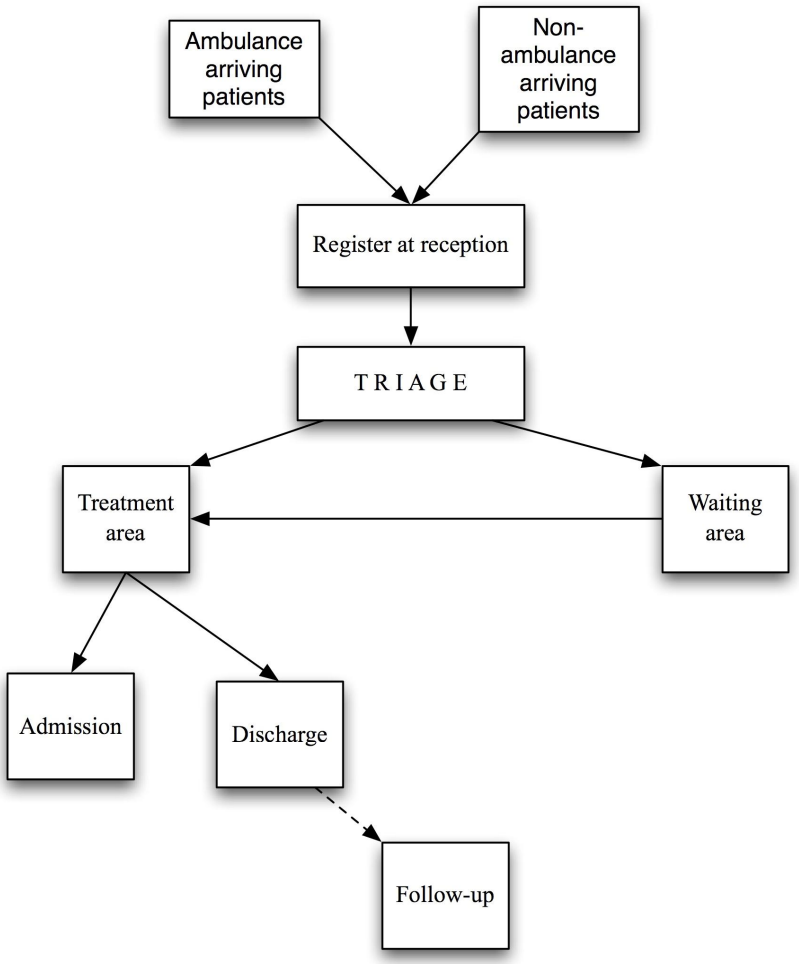

FIGURE 2. Illustration of clinical workflow in the ED (modified by the researcher from: Göransson 2006, Ruohonen 2007).

The factors that regulate the process of ED work are the inflow, throughflow and outflow of patients (Figure 3). ED crowding occurs when inflow is greater than outflow. ED crowding, in turn, is associated with adverse effects as poor patient outcomes, long waits to be seen, and patent dissatisfaction. (Patel and Vinson 2005, Hoot et al. 2008.) Thus, the throughflow time is of paramount importance, and inadequate staffing appeared to be one factor being in the position of possibly causing crowding (Hoot and Aronsky 2008).

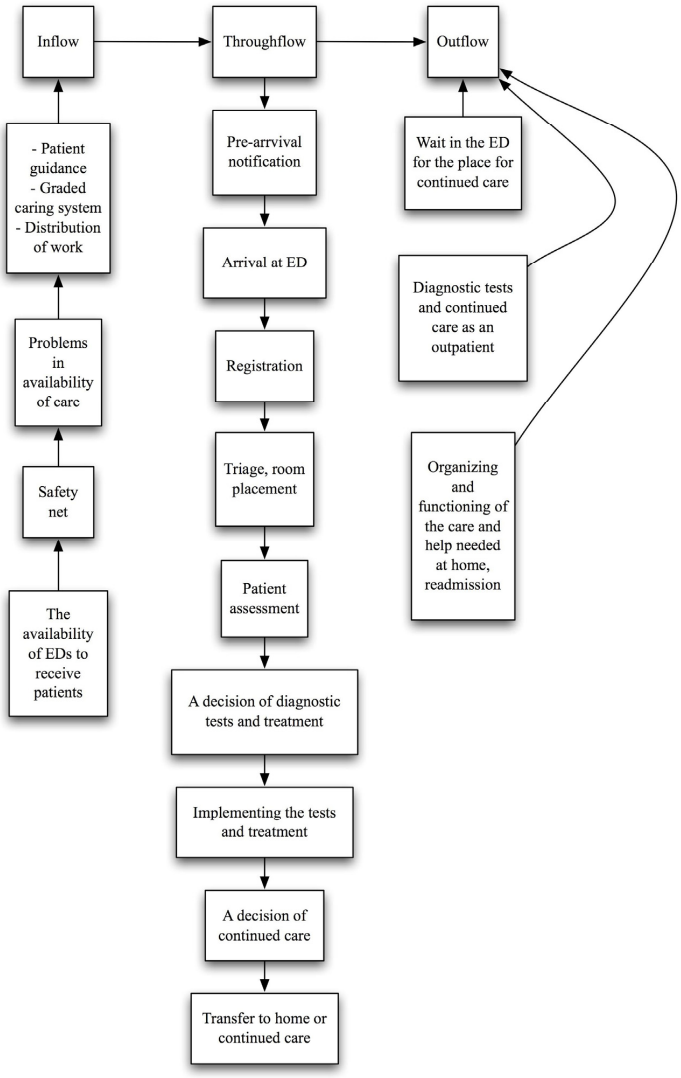

FIGURE 3. Factors regulating ED working process according to Koponen and Sillanpää (2005, modified by the researcher).

Numerous definitions and descriptions exist for the concept of a profession. According to one of them, professions are such compilations of expertise to which an established and distinguished status has gradually been formed (Tolppi 2001). From this standpoint there probably is no hindrance to defining ED nursing as a genuine profession. On the other hand, one of the most prominent features of a profession is the requirement for the possession of formal knowledge, and a profession without formal knowledge is an impossibility as a definition (Tolppi 2001). Furthermore, formal knowledge is usually acquired within education, which frequently is institutional and aims especially at a certain profession. This, for the time being, is lacking in Finland in terms of special qualifications available to ED nursing. The nurse-paramedic (Bachelor of Health Care) educationl programmes of Finnish Universities of applied sciences are approaching this aim (Ministry of Education 2006), but still we do not have the established, distinguished and officially approved concept and scope of practice for ED nurse and nursing.

During the through-flow phase of the ED working process, one of the most demanding and clinical skill-consuming fields of action is the triage- phase. The concept of triage is attributable to a French word *trier*, which stands for sorting, and patient sorting actually is what ED triage is all about. The concept of triage goes back to 19th century French wartime surgery, within which, as far as is known, there was initiated the sorting of wounded soldiers according to the severity of their injuries, and to focus the treatment first to the most severely injured. During the next century this policy was begun to be applied within armies around the world. During World War I evidence was developed that triage was concerned with the improved prognosis of certain war injuries. Thus, triage can be regarded as one of the first implementations of medicine after first aid (Derlet 2002).

Triage in the ED settings relates back to the early part of the 20th century, where in certain overburdened North-American EDs some kind of patient sorting began to be implemented rather by chance than as a consequence of systematic consideration. It was not until the latter half of the 20th century that triage began to be implemented more systematically in hospital EDs, where continuously on-call physicians became a national standard (Derlet 2002).

Within specialised medical care in-hospital, triage means a swift assessment of every patient entering an ED. The triage role, being predominantly a nursing role, is especially characteristic for ED nursing, and differentiates ED nursing from other nursing specialities (Considine et al. 2000). Triage is implemented by a nurse specifically assigned for this

purpose (the triage nurse), utilising predetermined criteria and with the objectives being as follows: 1) Promptly identifying patients requiring immediate, definitive care; 2) Define the appropriate area for treatment (i.e. medical, surgical, neurological areas, or fast track/urgent care clinics); 3) Facilitate patient flow through the ED, and avoid unnecessary congestion; 4) Provide information and referrals to patients and families; and 5) Alleviate patient and family anxiety and enhance favourable public perceptions of and experiences with emergency services (Tipsord-Klinkhammer 1998). In addition to the aforementioned, a variety of tasks and duties may, depending on a hospital's policy, be added to the scope of a triage nurse's practice, e.g. initiation of diagnostic tests, including laboratory studies and radiographs, making an immediate diagnosis, and even prescription of certain medicines (Williams and Sen 2000, Zimmerman 2002).

It seems reasonable to postulate that the most important aim of ED triage is to find, among the continuously growing flows of patients, especially those whose clinical condition is obviously severe or whose condition may deteriorate critically as a function of time. Detecting an impending high-risk event, which has the potency of leading to catastrophic collapse of the patient's clinical state, is one of the most demanding and difficult areas of ED nursing's domain and which requires such special expertise, which is called clinical skill in this study. At its best it can save a patients' life, but at its worst it's deficiencies can jeopardise the patient and lead to catastrophic deterioration of their clinical condition, or even to death, without anyone even knowing what is going on in the ED (ENA 1997, Zimmerman 2002, Tippins 2005).

All in all, the phenomena of preventable critical illness and death have received considerable scientific and clinical interest recently, especially at acute care hospitals. With reference to several scientific reports, tendencies seem to prevail as described next: 1) Patients suffering unanticipated critical events often exhibit signs of physiological deterioration, even hours before the collapse; 2) In some cases the deterioration is well documented, but with little evidence of appropriate intervention; 3) In other cases the monitoring and recording of vital signs turns out to be infrequent or incomplete; 4) There may be indications to assume that the understanding of the mechanisms that lead to clinical crises may not always be sufficient to enable adequate clinical action; 5) The findings may suggest that an algorithm-based system is needed for guaranteeing a suitable clinical response to a deteriorating patient. (Vincent et

al. 2001, Chellel et al. 2002, Angus and Black 2004, Bion and Heffner 2004, Ryan et al. 2004, Skrifvars 2004, Nurmi 2005, Smith et al. 2006.)

However, these studies mainly concern hospitalised patients on general wards. The pathology leading to unanticipated adverse events with these patients is related to long-lasting insufficient tissue perfusion and oxygenation and, when assessed retrospectively, might still have been anticipated provided that the nursing personnel had had enough time, knowledge and skills as well as an unambiguous protocol for monitoring patients and reacting to what might have been discovered. Out-of-hospital, non-traumatic, cardiac arrests are known to be mainly cardiac arrests connected with malignant arrhythmias induced by coronary disease (Nurmi 2005, Arntz et al 2008). EDs could be described as corridors between out-of-hospital and in-hospital circumstances. To what extent the unanticipated deterioration of patients' clinical condition in ED have similarities with these different kinds of phenomena remains unclear to the researcher. In a study by Ruiz-Bailèn and Morante-Valle (2006), according to echocardiographic findings during on-going CPR in 32 patients brought to the ED or intensive care unit without a previous diagnosis, the following features were observed: Cardiac tamponade in four patients; two type-A aortic aneurysms; one papillary rupture; two patients had dynamic hypertrophic obstructive cardiomyopathy; six patients with dilated cardiomyopathy; one patient with spongiform cardiomyopathy; three patients with aortic disease; twelve pulmonary embolisms; and one patient with a cardiac mass (rhabdomyosarcoma) (Ruiz-Bailèn and Morante-Valle 2006).

This innovative study does not yet, however, reveal the whole picture as, like the authors also state, a prospective, controlled study with larger populations is needed (Ruiz-Bailèn and Morante-Valle 2006). It also seems unlikely that these findings, albeit important, would be sufficient to explain unanticipated adverse events occurring in EDs. All in all there seems to be a tendency, according to which the risk of adverse events is higher for patients admitted to EDs and general medical wards than for those admitted for elective surgery. Clinically important adverse effects most commonly affect the elderly, who also account for the majority of emergency admissions (Leape et al. 1991, Bion and Heffner 2004) The aetiology of intra-hospital cardiac arrest is poorly described (Nurmi 2005). However, although most of the adverse events with hospitalised patients turn out to be less malignant, a cavalier attitude towards these events can hardly be tolerated, as patient safety has to be the focus of all health

care pursuits (International Council of Nurses 2002). There seems to be a call for a systematic approach for the prevention of these events (Bion and Heffner 2004).

The key role of professional nurses in preventing cardiac arrest has been strongly emphasised. The decreased availability of highly skilled professional nurses translates into lower patient-to-nurse ratios and higher incidence of death (Aiken et al. 2002, Needleman et al. 2002). Unfavourable patient-nurse ratios may also hinder early recognition of warning signs, and therefore the prevention of imminent cardiac arrest (Weil and Fries 2005). With reference to the aforementioned, and possibly due to its clinical importance, the accuracy and reliability of triage performed by ED nurses has also recently been the object of intensive research (e.g. Cooke and Jinks 1999, Fernandes et al. 1999, Travers 1999, Washington et al. 2000, Wuerz et al. 2000, Considine et al. 2001, Parenti et al. 2006).

Despite the fact that triage only covers one area of the through-flow phase for an ED patient, it requires such clinical skill that is constantly needed when repeatedly assessing and re-assessing the clinical condition of ED patients. Furthermore, it is reasonable to claim that the skill required to make a rapid and reliable assessment and re-assessment is a fundamental attribute of and a prerequisite for an ED nurse. Thus, the predominant attention paid to this isolated area of compilation of theoretical knowledge and clinical experience conceivably turns out to be justified in this research report.

2 A literature review

2.1 Clinical skill and closely related concepts

The purpose of this chapter is to illuminate the versatility of the main concept in the focus of this research and its close relatives. With reference to Ruohotie and Honka (2003) such concepts as competence, skill, qualification, ability, capacity, performance and proficiency are tied to each other. They are a mixture of knowledge, behaviour, attitudes and values, and they all refer to mastery of some skill. Furthermore, they are related to creativity, innovativeness, flexibility, accuracy and preciseness.

2.1.1 Clinical skill

When trying to define the concept of clinical skill it seems unavoidable to talk also about skill, competence and knowledge. For a start, the researcher defines clinical skill as skill applied in clinical settings. The following longish citation of Ruohotie and Honka (2003) aims at building more profoundly the underpinnings of the concept of clinical skill applied in this study. Attewell (1990) regards skill as a synonym of competence, albeit his definition generates a notion of expertise, mastery and excellence. Ability to do something skilfully is found to be characteristic to the concept of skill, which, in turn, is always associated with knowledge and understanding. Application of any knowledge into practice takes skill. It seems appropriate to refer to Ruohotie and Honka (2003) due to their claim that the emphasis, put on the cognitive aspect associated with skills, has resulted in the valuation of mental and physical capability. On the other hand the physical aspect as dexterity and manual skills have often been left in the shadow.

With reference to Webster's Dictionary, (1996) *clinical* stands for something that pertains to a *clinic* or is *pertaining to* or *used in a sickroom*. Moreover, *clinical* is concerned with or based on *actual observation and treatment of disease in patients* rather than on artificial experimentation or theory.

In this study, based on the aforementioned quotations and definitions, clinical skill is regarded as mastery of such a combination of knowledge, skills and attitudes that enables an ED nurse to master the assessment and diagnostic functions, to possess the attributes required in responding adequately to any clinical incident that may occur, and to master the evaluation of the patient' s response to the care that has been provided, and reassessment of both the patient

as well as the situation at hand. Even though clinical skills definitely are at the core of any nurse' s professional practice (Nicol and Freeth 1998), clinical skill turned out to be an ill-defined concept. Such an impression was formed that clinical skill is a concept taken for granted and not necessarily needing an accurate definition, like anyone should self-evidently perceive the concept in the right way. This claim was based on rather extensive review of the literature, e.g. Hilton (1996), Nicol and Freeth (1998), Boxer and Kluge (2000), Spunt et al. (2004), Morgan (2006), and Roxburgh et al. (2008).

The Institute of Medicine of the National Academies, USA (2004), refers to Goethe, when stating 'Knowing is not enough; we must apply. Willing is not enough; we must do'. The everyday non-scientific observation of the researcher is in concordance with the preceding statement, i.e. increased knowledge is not a synonym for increased understanding. Furthermore, time has not been able to refute the Aristotelian intuition, according to which such a skill that aims merely at indefinitely promoting one's own objectives will not be capable of solving solve any of our problems. The application of skill is decisive, and that in turn, also requires ethical consideration deriving from practical sense (Sihvola 1992). It seems reasonable to postulate that clinically skillful ED nursing deals with all of these factors: knowing, applying, willing and doing, skilfully and with ethical consideration (ENA 2003). Correspondingly, the key-concept of this study, clinical skill, arises from and is built upon those preceding components.

2.1.2 Skill as a concept

Skill is a complicated and multi-faceted concept. According to Webster's Encyclopedic Unabridged Dictionary of the English language (1996, 1335), *skill* stands for '*the ability, coming from one' s knowledge, practice, aptitude etc., to do something well', 'competent excellence in performance; expertness; dexterity' 'a craft, trade or job requiring manual dexterity or special training in which a person has competence and experience*'. One of the several obsolete meanings is 'understanding'. Similarly, *skilled* stands for *'having skill; trained or experienced in work that requires skill'; 'showing, involving or requiring skill, as certain work'. Skilled labor* meaning *'labor that requires special training for its satisfactory performance'*. Furthermore, it is hardly possible to ignore the fact that the concept *art* stands, among other meanings, for '*exceptional skill in conducting any human activity' (Webster' s Encyclopedic Unabridged Dictionary of the English language (1996, 84)*. The synonyms for *skill* in greece (*tekhne*), in latin (*ars*), in german (*Kunst*) and in swedish (*konst*) also indicate

that the concept of skill carries with it interest-arousing connections with several domains of human action (Niiniluoto 1992).

With reference to the aforementioned evidence, it seems clear and necessary that the conceptual basis of this study is built on the fundamental idea that the concept of skill is not synonymous with something that is merely technically competent performance. Nevertheless, everyday, non-scientific, experience of the researcher is that within the discipline of nursing there may sometimes have emerged a slight undervaluation or even misunderstanding concerning the non-superficial meanings of the concept of skill, see e.g. Kaskinen (2006). Reducing the concept of skill to merely technical performance, or even a form of playing tricks, is not in concordance with the original, traditional and multi-faceted meanings of this concept (Halonen et al. 1992).

2.1.3 A retrospective review of skill

In order to enable the reader to catch the approach the researcher has had in terms of the concept of skill as a combination of theoretical knowledge and practical mastery a historical view is provided. The originally Greek word technique along with its derivatives can be used more widely to describe any action requiring skilfulness or magic, even though the action would belong to the domain of Aristotelian praxis (sports, dance, circus acrobatics) rather than that of productive work. Here skill (poiesis) does not, in the first place, refer to a productive ability to achieve certain results (e.g. skill to make iron), but a skilled way of performing the action (e.g. figure skating). (Niiniluoto 1992.)

During the Middle Ages, a system of so-called liberal arts (grammar, dialectic, rhetoric, geometry, arithmetic, astronomy, music) rose to be the core of the educational system (Figure 4). From the philosophical faculties, acting as heirs of the Middle Ages' universities, 'Masters of Arts' are still graduated.

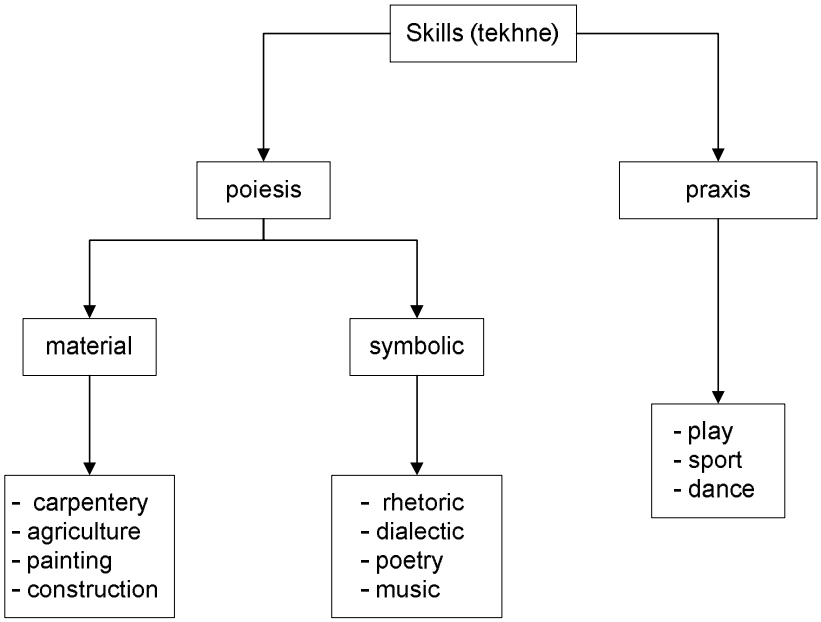

FIGURE 4. The system of liberal arts according to Niiniluoto (1992, modified by the researcher).

During the fifth century, the most advanced skill was medical skill, which can be said to have, already in that early phase, developed to be a certain kind of practical science. According to the Hippocratic physicians, only such competence as is based on well reasoned theoretical knowledge could be regarded as real skill (Sihvola 1992). Aristotle specified the concept of skill, emphasising the distinction between skill and merely mechanical skilfulness. Real skill requires, in addition to functional competence, intellectual comprehension of the principles upon which the execution of the skill is based on. Aristotle adhered to the Greek tradition when combining together the concepts of skill and knowledge (Sihvola 1992).

In Finnish, the concepts of skill and knowledge have as originating from the sixteenth century had approximately the same meaning. Skill could refer to person's mind, consciousness, soul, sense or knowledge. The concepts of knowledge and skill have gradually achieved stable meanings, and skill is now understood to be composed of the mastery of performance and the knowledge related to that. (Vertanen 2002.)

2.1.4 Qualification, competence and vocational proficiency

The concepts of qualification, vocational competence and proficiency are used in miscellaneous ways. To some extent they are even regarded as synonyms. These concepts are related to each other and they have a mutual core, but each of them also has its own meaning. Qualification can be defined as a specification of quality, eligibility, aptitude, and as fulfilling the conditions set. Qualification reveals an expression of quality and qualitative application. Qualification also stands for the knowledge and skills required due of the technical content of the working process, the demands made on the motivation and compliance of the employee and their innovative attributes. Some of the qualifications are profession-specific, while others are general qualifications (Hilden 1999).

Hilden (1999) presents, with reference to Streumer (1993), that competence, i.e. the concept of vocational proficiency, has a close relationship with the concept of qualification. Competence tends to be regarded as a more abstract concept than qualification. While qualification refers to ability to perform concrete actions, competence, in turn, refers to regulation of these actions. As far as competencies are concerned, they deal more with the structure of cognition, interpretation of schemes and operational models, than particular skills or solitary components of knowledge (Pelttari 1997). According to Söderström (1990) competence is conditional and means that competence does not exist as such, but it is always relational to a task or action. If these are not recognized, the concept is insignificant.

Vocational proficiency is difficult to describe, as in Finnish the term vocation carries different meanings. Vocational proficiency is something that is required by the vocation. In this way, the extent of vocational proficiency varies according to the definition and comprehension of the concept of vocation (Taalas and Venäläinen 1994). With reference to Ellström (1994) it would seem reasonable to postulate that proficiency may be regarded as a superordinate concept, below which can be differentiated, among others, vocational proficiency, and clinical skill in turn as one of its components.

2.2 Emergency nursing and clinical skill illustrated by literature

For the purposes of clarifying and strengthening the scientific underpinnings of this study it has been considered necessary to obtain a view as broad and profound as possible of the phenomenon in focus, hence a literature survey was performed. The subject headings used were *emergency nursing* AND *clinical competence* (Mesh-terms) from PubMed (years 1990 –

2005, English language, blind peer reviewed, or double blind peer reviewed, or expert peer reviewed or peer reviewed journals) provided 223 hits. A further survey with the same subject headings from PubMed, as well, (years 2005 – 2007, English language, blind peer reviewed, or double blind peer reviewed, or expert peer reviewed or peer reviewed journals) gave 35 hits more. A search of the same database with subject headings *emergency nursing* AND *Delphi technique* provided eight hits. The database CINAHL (Cumulative Index of Nursing and Allied Health Literature) with subject headings *emergency nursing* or *emergency care* or *emergency service* AND *clinical competence* or *nursing skills* (years 1990 – 2005, English language, blind peer, or double blind peer, or peer reviewed journals) gave 195 hits. Finally, the database CINAHL with subject headings *emergency nursing* or *emergency care* or *emergency service* AND *clinical competence* or *nursing skills* AND *Delphi technique* (years 1982 – 2006, English language, blind peer reviewed, or double blind peer reviewed, or expert peer reviewed, or peer reviewed journals) provided 30 additional hits. The decision to use *competence* as a subject heading stemmed from the previously mentioned finding that clinical skill turned out to be an ill-defined concept, and competence seemed to be occasionally used as a synonym on clinical skill. In order to avoid loosing valuable data the concept of competence was attached to the subject headings used.

Articles for the next summary were chosen on the basis of frequency and relevance of the item in the reviewed literature. Estimation of relevance was conducted by the researcher, and was directed by the purpose and aims of the study. A few interesting articles had to be rejected because of complications concerning their availability. Finally, an additional survey with subject headings *clinical assessment / clinical judgement* from the previously mentioned databases was performed. This procedure was conducted as the theme of ED nurses' independent decision making started to appear more and more clearly among the material obtained. Seven articles more were finally selected under these subject headings. Thus, the following classification was formed (the order of presentation carries no importance here): a) Clinical judgement; b) ED triage; c) Caring and/or nursing role of the ED nurse; d) Expanding scope of and ED nurse's practice; e) Clinical competence / competence assessment; and f) Studies utilising Delphi technique. The classification was based on such themes that seemed to appear distinguishable, when the aforementioned subject headings were applied.

2.2.1 Clinical judgement

Health care professionals are frequently asked to engage in complex and unpredictable tasks, and society expects them to exercise discretion when deciding what is in the best interests of patients. Due to the nature of emergency medicine and nursing, these judgements are bound to sometimes lead to error, and this is inherent to any professional practice. Professional judgement is fundamentally based on practical wisdom, which, in turn, is one form of knowledge (Coles 2002).

With reference to Coles (2002), at the very core of clinical judgement is the endeavour to determine not exactly the *right* response (which does not even always exist in an absolute sense) but the *best* in any given situation encountered in the often hasty circumstances of an ED. Despite this however, the *best* response can still be claimed to be the *right* one because it is reasoned response and can be defended and justified as morally appropriate to the particular circumstances in which it was made.

Protocols and standing orders are valuable in numerous clinical situations, and the rationale of obeying them has evidential base. However, even the most intense activity consists of decisions in terms of issues of *best* and *right*. As Coles (2002) states, being professional starts, when the protocol no longer helps, and without judgement professional practice is merely technical work. These observations bear clinical and scientific relevance, as they may lead to birth of systematic assessment of practitioners' practical wisdom including the thinking that lies behind the actions taken.

Clinical judgement is an essential skill required from every nurse (Lasater 2007). Tanner' s (2006) review of nearly 200 studies related to clinical judgement in nursing revealed that good clinical judgement requires a versatile ability to recognise salient aspects of an undefined, vague clinical situation, interpret their meanings and importance, and respond appropriately. Furthermore, profound understanding of the pathophysiological and diagnostic aspects of a patient's clinical presentation, as well as the burden the situation sets on the patient and the relatives, are of paramount importance for any nurse, let alone an ED nurse.

Tanner (2006) has created a research-based model of clinical judgement to describe the way nurses' think, and calls this as a form of engaged moral reasoning. This Clinical Judgement Model consists of components as follows: noticing; interpreting; responding; reflecting; and reviewing the outcomes of action (Nielsen et al. 2007). This model easily covers the clinical

course of actions implemented in the EDs. Based on the aforementioned reasoning clinical judgement can be called a super-ordinate concept in terms of clinical patient assessment, which respectively forms an essential component of clinical judgement.

Clinical judgement as a concept is close to clinical decision-making, and they both respectively are related to the autonomy of nurses in clinical practice. The findings of Bucknall and Thomas (1997) indicate that several difficulties are associated with making decisions. Medicine widely holds the monopoly to several central tasks, such as diagnosis and therapeutic measures. Due to this, many nurses feel uncomfortable with the power disparity. An increasing interest has developed over recent years associated with the autonomy of nurses in clinical practice. Nurses' quest for professional status involves an expanded role and increased responsibilities, which, in turn, are closely linked with medical tasks that are commonly delegated by the medical practitioner. A strong association between decision-autonomy and job satisfaction has been demonstrated.

The study by Bucknall and Thomas (1997), conducted in critical care circumstances, demonstrated that the nurses felt themselves to lack the power of making autonomous decisions, even though they were found to be high frequency information providers. They were found to provide most of the information for treatment decisions, but still be more likely to suffer from job dissatisfaction. Even though this study was not conducted in the ED, it seems reasonable to assume that the findings could be generalised to ED surroundings as well.

Ebright et al. (2003) demonstrated that health care personnel are repeatedly challenged by unpredictability, missing information, inappropriate or inadequate technology, and constant change. This, in turn, may jeopardise patient safety, the safeguarding of which is the ultimate goal of all health care professionals. The complexity of work in emergency nursing settings was evident, even though this study was not, either, conducted in the ED. A pattern of anticipation or forward thinking in order to manage workload was detected. This required clinical judgement disguised in the prioritising of tasks. Strategies to monitor patient status proactively were frequently seen, hence also indicating that the nurses performed clinical judgement for managing the situation both of the patients and the tasks and duties to be done.

2.2.2 ED triage

A considerable effort has been put into researching ED triage, which most probably indicates the clinical importance of the domain. This was also addressed by Bruce and Suserud (2005) in stating that one of the most important tasks of an ED nurse, when receiving a patient, is the handover and triage function. According to their findings, these are regarded as highly symbolic events, especially when a patient is transferred from ambulance stretcher to the hospital stretcher. The communication between ambulance crew and ED nurses was very structured. If the patient was more seriously ill/injured, the likelihood of a non-ideal triage and handover was elevated. This has clinical relevance, because the aim of the triage and handover process is to safeguard that the patient has received the correct care at the appropriate level, and that this information is conveyed further on. The research identified areas where improvements could be made.

The following categorisation under the theme ED triage follows the appearance of issues obtained by subject headings clinical assessment and clinical judgment. According to the literature reviewed triage seemed to be tightly connected to these phenomena. Albeit triage decisions most definitely are manifestations of ED nurses' clinical judgment as well as clinical decision-making, they will be presented in this literature review as an own entity under the theme ED triage. This, in turn, was a decision based on the crucial role of triage in the clinical ED nursing. On the other hand, this decision can be challenged with good reasons, as clinical assessment and clinical judgment play a most fundamental role in all ED nursing.

Telephone triage

Telephone triage and patient guidance has received growing attention lately. The legal implications of telephone triage are discussed by Coleman (1997), and the use of detailed documentation and communication skills are emphasised when trying to protect the ED nurse legal action and consequences. The Coleman (1997) article strongly points out the importance of seeing telephone triage as part of an ED nurse's responsibilities and nursing functions. In a simulated telephone triage situation, it has been shown that this can be implemented within a systematic and identifiable framework by ED nurses responsible for the triage dispositions via telephone (Edwards 1994). The final decision concerning the triage disposition was made through balancing the most probable outcome against the worst possible outcome. Whether the systematics identified within the research were a result of formal training or of experience and more inclined towards tacit knowledge (Nurminen 2000, Loveridge 2004), remains

unclear to the researcher. However, these items have relevance in Finnish hospital organisations as written orders or protocols for telephone guidance and triage are not necessarily always to hand for ED nurses.

Paediatric triage

In the USA, paediatric emergencies are a common problem that result in approximately 12.5 million visits to EDs annually (Thomas 2002). It is thus understandable that paediatric triage is widely researched, especially in North-America and Australia. Furthermore, paediatric triage poses a special challenge for any ED nurse, since the needs of children in emergency situations differ from those concerning adults. Developmental and physiologic variations make communication, assessment and identification of a serious illness/injury essentially different than with adults, not even to mention the challenges posed and confusion resulting should a paediatric patient happen to enter an ED not accustomed to receiving paediatric patients. ED nurses should, according to Thomas (2002), be allowed to develop a sixth sense in recognising and treating children, and to become confident in triage decisions. This does not, however, appear to be the case, as the level of agreement between nurses applying the Australasian Triage Scale (ATS) turned out to be no more than moderate, and lower than the consistency when applied to adult patients. As both ED nurses and paediatric emergency physicians have shown only a moderate level of agreement and accuracy of paediatric triage assignment, a conclusion can be drawn as follows: Inconsistent allocation of triage categories may lead to inappropriate waiting times, which in turn may have detrimental effects on certain patients' clinical condition. Serious attention is justified to improve paediatric triage, the crucial step in emergency care (Bergeron et al. 2002, Crellin and Johnston 2003).

Detecting signs and indicators of possible child abuse among paediatric patients presenting with physical trauma would be of utmost importance in organising appropriate help for the child and the whole family. McKinney et al. (2004) investigated whether cases of possible non-accidental injuries as identified using five risk indicators would arouse suspicion of child abuse. Triage nurses' performances were studied, and the results indicated that the introduction of a policy of identifying positive indicators from the five risk indicators of child abuse was not sufficient in itself to raise concern. Additional computer support within EDs was suggested.

Triage with coronary heart disease

Coronary heart disease (CHD) is the major cause of mortality for adults in the USA, and in Finland (Ruotsalainen 2006) as well. Even though men are suffering from CHD more often than women, the likelihood of a woman dying after an acute coronary event is greater, and the likelihood of receiving prompt or aggressive treatment is smaller (Arslanian-Engoren 2004). Triage nurses' contribution to the detection, allocation of triage categories, and initiation of treatment with CHD has been thoroughly studied. In order to ascertain whether triage nurses' initial triage decisions could predict admission or discharge for acute coronary syndromes, a total of 108 nurses' triage decisions were examined. Accuracy for predicting admission, as well as for discharge diagnosis, turned out to be poor (Arslanian-Engoren 2004). When compared by the gender or demographic characteristics of the triage nurse in terms of triaging male and female patients presenting with symptoms suggestive of acute coronary syndrome (ACS), men and women were equally likely to be given an ACS triage decision. However, female patients were more likely to be assigned a suspected cause of cholecystitis for their symptoms. It was also observed that nurses used different cues to triage men and women with equal symptoms suggestive of ACS (Arslanian-Engoren 2005).

Cardiogenic pulmonary oedema (CPO) is an immediately life-threatening complication of left ventricular dysfunction, usually associated with acute myocardial infarction or other severe manifestations of CHD. Intervention of continuous positive airway pressure therapy (CPAP) in CPO by the triage nurse turned out to have a positive contribution to a favourable outcome with these patients. When the triage nurse was more experienced, these patients were more likely to be recognised at triage as requiring CPAP therapy. The early application of CPAP both reduced hospital mortality, length of hospital stay, and the need for intubation and ventilation. An educational issue is to decide how to more effectively educate nurses in identifying CPO in patients presenting with acute respiratory failure (MacGeorge and Nelson 2003).

Education for triage

As the ED triage has shown to be a critical phase in the care of an acutely ill/injured patient, the education and preparation of nurses for this specific purpose has also been the object of research. It appeared that a notable proportion part of the nurses working in triaging roles had not had any formal, unit-based, triage education (Gerdtz and Bucknall 2000). The need for more formal education and the importance of emergency nursing experience, as well as

positive reinforcement from management, were important topics (McNally 2001, Cone and Murray 2002). Naturalistic research methods are pointed out to be needed in order to evaluate and improve the triage process, and of the outcomes of these decisions in practice (Gerdtz and Bucknall 1999).

Issues related to triage decisions

Andersson et al. (2006) have found both internal and external factors to be connected to nurses' triage decisions. The internal factors reflect the nurse skills and personal capacity, while the external factors reflect work environment, including high workload and practical arrangements. These factors in turn serve as a basis for the clinical decision-making, and combined with patients' clinical condition, clinical history, various examinations and tests, an assessment is formed which subsequently leads to a prioritisation (Andersson et al. 2006).

2.2.3 Nursing and caring role of an ED nurse

Emergency nursing may currently be regarded as a specialist service of the health care system. Previously, the role and competence of an ED nurse could have been described as 'Jack-of-all-trades, master of none'. Whether this claim has ever been valid remains unclear, but advances in technology and expansion of roles has raised a serious question of whether we are giving up nursing. Even though Nicholson's (1996) article above all expresses concern in terms of too many nurses' tasks being taken over by unqualified staff, the core of the nursing profession, caring, was also feared to be in jeopardy. Here, caring is interpreted to be a synonym on nursing, but slightly more in a meaning of the verb to look after (huolehtia in Finnish).

Increased workload and the impending shortage of nurses are expected to reflect negatively on the availability of proper care for some patients. Patients' perceptions of caring have been stated to be of major importance when organising nursing practice under current and future circumstances. In order to discover which nursing care behaviours are perceived as important indicators of caring by patients in an ED, Baldursdottir and Jonsdottir (2002) conducted a quantitative and descriptive study. Their results are in concordance with several previous studies, as the respondents ranked such items as 'know what they are doing' and ' know how to give shots, IVs and how to handle equipment' as the most important nurse caring behaviours. The subscale 'human needs assistance' was ranked highest. Thus, clinical competence was considered as the most important nurse caring behaviour, while caring itself seems to be an essential and integral component of all interactions with patients. It might,

therefore, be justified to claim that clinical skilfulness does not rule out the emphatic caring behaviour of an ED nurse. There seems to be strong evidence that patients appreciate both of those abilities.

Florence Nightingale most probably was the first to study the hospital environment in proportion to patients' well-being. Emergency nursing environments in particular have been described as sterile, disorienting and untrustworthy. In such an environment, surviving itself and living beyond the confines of the hospital was the most significant indicator of quality of care as observed from the patients' perspective, as reported by Shattel et al. (2005). This result can hardly be regarded as unexpected. However, human-to-human contacts, which most often are encounters between a nurse and a patient, increased security and power and decreased patients' fear and anxiety. Patients in the emergency nursing settings wanted friendly, attentive and responsive nurses, who listen to them and genuinely care about their needs. To some extent surprising to the authors of the study in focus were the discoveries that patients did not expect lengthy conversations and interactions. Brief but frequent contacts were enough to decrease patients' fear and insecurity (Shattel et al. 2005). These findings have clinical relevance and importance, as it is so often heard that in the pressurised ED circumstances the nurses do not have time for their patients. This is needless to deny, but the results of this study give reason to assume that patients can be comforted and cared for even with a few occasional friendly and well-timed words. This knowledge, in turn, might perhaps relieve the constant feeling of inadequacy that is probably familiar to all ED nurses.

The feeling of inadequacy and being unable to execute 'the art of nursing' in a meaningful way almost incidentally turned out to be a major concern described by Keough et al. (2003). When nurse satisfaction is low, so is patient satisfaction, not to mention patient safety (Leiter et al. 1998). The genuine ethos of nursing involves ability to touch lives in a meaningful way. However, this ability is feared to be getting out of the nurses' hands as the genuine love and caring for people is getting replaced by overcrowding in the ED, and lack of qualified, experienced personnel is growing. Health care systems around the world are struggling with the aspiration for greater 'efficiency', which seems to be regarded as a synonym to getting the most from the professional at the bedside at all costs instead of looking how to improve the ability of the nurse to deliver care (Keough et al. 2003). The justification of these exceptionally strong words published in a scientific paper may possible arise from a profound

concern of ED nurses' future possibilities to implement emergency nursing in a way that is expressed to be patients' wish according to the aforementioned reports.

Several suggestions were made by Schriver et al. (2003) for tackling the impending vicious circle presented in the form of nursing shortage, in order to enhance ED nurses' possibilities for implementing implement emergency nursing care according to both patients' and nurses' needs and wishes, and thus strengthen the ED safety net of health care system. Emergency physicians and emergency nurses might partner with hospital administrators in order to address strategies as follows: 1) Improve the workplace environment by improving nurse-to-patient ratios and avoiding the holding of admitted patients in the ED; 2) Re-focus the ED nurse job description towards the needs of patients and their families; 3) Promote mutually supportive relationships between ED nurses and physicians; 4) Create an environment that allows unique solutions to staff scheduling and that accommodates shift work; 5) Increase nursing wages and recognise the special contributions of ED nurses through financial rewards; 6) Identify and promote ED personnel as members of an elite unit; 7) Develop preceptorships and internships for new ED nurses and invest in clinical specialists or nurse-mentors; and 8) Invest in nursing education.

Patients entering a non-psychiatric ED and presenting with mental health disturbances, either as a main diagnosis or as a co-morbid factor, are not uncommon. Effective management of psychiatric emergencies has emerged as a growing and important area in the field of ED nursing. Psychiatric clinical nurse specialists might, with their advanced training in psychodynamics, pathophysiology, physical assessment and crisis intervention, be ideal practitioners to respond to the needs of these individuals. A new kind of expertise could possibly be brought to the ED that would allow comprehensive biopsychosocial assessment, effective crisis intervention, and consideration of need of continuing care and follow-up (Karshmer and Hales 1997). These sketches from more than a decade ago are further emphasised by the findings of McLaughlin (1995), as the competence of ED nurses in counselling overdose patients was found to raise doubts and to be significantly different from their competence with other patients (McLaughlin 1995). Furthermore, ED nurses have been demonstrated to possess a perception according to which they are responsible for patients' families in situations where the patient's condition is critical and families are suddenly bereaved. However, caring for families was not a specially defined factor in EDs involved in the study cited here. Education in caring for families was also missing (Hallgrimsdottir 2004).

Even though the counselling and caring for the families of critically ill/injured patients can hardly be left to this (or any other) particular group of ED nurses, their availability might possibly promote confidence and collegial support to all ED nurses having to face these demanding situations.

Providing good nursing care for elderly patients in EDs is a major concern, as EDs tend to have a medically technical character and visits there increase substantially as people age. Both the total number and relative proportion of older people in our society are rapidly growing, which introduces along requirements for balancing not only profound geriatric medicine and nursing knowledge and skills, but also appreciative caring. From the 12 interviews of older patients visiting EDs, five themes could be identified as indicators of patients' experiences of their care, namely needs for information, observations of waiting times, perceptions of professional competency and caring service, concerns about process and facility design, and personal tolerance (Watson et al. 1999).

When ED nurses' own perceptions of older patients care were studied, such observations were made, that, in order to be able to provide good nursing care for these patients, ED nurses should be knowledgeable and understanding of the older patient' s situation and be prepared to take responsibility for them. The obstacles to provision of good nursing care were the prioritising of medical procedures and everyday tasks and routines. A need for prioritising differently in the future was considered necessary in order to meet the needs of, and thus serve better, this growing group of ED visitors (Kihlgren et al. 2005). It seems obvious that no significant contradiction exists between older patients' and ED nurses' perceptions of factors related to feelings of good nursing care experienced by older patients.

2.2.4 Expanding the scope of an ED nurse's practice

In North-America, expanded scope of an ED nurse' s practice has been implemented for years. This advanced practice is known as the Acute Care Nurse Practitioner (ACNP) service. Studies conducted in the USA and Canada have revealed a positive connection between the existence of ACNPs and critically ill/injured patients' experiences in the ED. (Norris and Melby 2006). The opinions of nurses and doctors from seven EDs and minor injury units towards the need for development of an ACNP service in the UK were gathered in a descriptive exploratory study. According to the results, there seems to be a call for an ACNP service and the respondents felt that it was important for the ACNP to have obtained a formal status, a specialist nurse practitioner qualification. Respondents were comfortable with nurses

undertaking such traditional advanced skills as suturing. However, reluctance was expressed towards more advanced skills such as needle thoracocentesis. Themes like inter-professional conflict, autonomy, and the need for ACNPs were identified from the interviews: (Norris and Melby 2006).

So, an obvious need for ACNPs was identified, but the blurring of boundaries between health care professions can result in inter-professional conflicts, especially in terms of the expanding autonomy which is implemented in the scope of an ACNP' s scope of practice. Thus, the importance of prompt preparation and inter-professional collaboration is suggested, when expansions of the nursing profession are taken under consideration (Norris and Melby 2006). These findings seem to be in concordance with those gained from the pilot-projects of The National Project for Securing the Future of Health Care (Hukkanen and Vallimies-Patomäki 2005).

In the Finnish health care system, a concept of ACNP is not officially recognised. However, Åberg and Fagerstörm (2005) have described a project, funded by the Ministry of Education, aiming at developing the expert nursing role in Ostrobotnia, Finland. That education is comparable to the international Nurse Practitioner education, and an obvious demand within nursing organisations for expert nurses, particularly within emergency health care issues, was identified in a study connected to the project. Yet, even though the aforementioned education is claimed to be comparable to the international Nurse Practitioner education, the role of the Finnish specialist nurse today appears not to be comparable. Thorough discussion at the national level is required for decision concerning the occupational title and professional scope of practice and remuneration, and the demand for this kind of group of professionals in our society (Åberg and Fagerström 2006).

Shortening of waiting times and expediting through-put times in EDs has been raised high on the agenda of several hospital organisations, and even on governmental agendas (Chudleigh 2004, Pohjola-Sintonen and Varpula 2006). In the UK the National Health Service Plan stated that waiting times in ED should not be more than four hours, and an average of 75 minutes. One way of approaching this aim has been the wide re-allocation of tasks between different health care professionals (Chudleigh 2004.) Empowering appropriately trained ED nurses to request, and to some extent even interpret x-rays, has been the object of considerable research interest.

According to Hardy and Barrett (2004), 52.7% of nurse managers responsible for Accident and Emergency Services within National Health Service hospitals indicated that nurses within their EDs were formally interpreting x-rays as part of their extended role. There appeared to be inconsistency in the range of examinations nurses are permitted to interpret and the level of education provided to support this role.

With reference to a wide literature survey, Chudleigh (2004) points out that the main disadvantage for patients in relation to nurse requested x-rays, unnecessary exposure to radiation, seems to be unfounded and is repeatedly refuted in the literature. The advantages, in contrast, seem to be indisputable for patients and personnel, both of whom appear to be satisfied with these services.

Connecting the duty to interpret x-rays officially and formally to the role of a Finnish ED nurse may seem as if 'coming from outer space', or at least being quite a remote idea. However, several studies indicate that nurse requested and interpreted x-rays, within certain pre-defined limits, can serve as a time-saving, safe and appropriate method of providing emergency health care services for patients with minor injuries living in both urban and remote areas (Lee et al. 1996, Meek et al. 1998, Benger 2002). On the other hand, role expansion does not take place without increased responsibility. A cavalier attitude towards the execution of the aforementioned new policies may turn out to be detrimental, and obvious risks have to be taken into serious consideration if these kinds of measures are planned (Hardy and Barrett 2003).

ED nurses' ability to utilise certain pre-defined rules in terms of particular clinical conditions of patients was evaluated by Fiesseler et al. (2005) and Miller et al. (2006). The former pointed out that nurses showed only moderate ability to interpret the Ottawa Ankle Rule for ordering x-rays, while the latter presents that UK ED nurses were able to use the Canadian c-spine rule to guide selective immobilisation. This leaves room for a speculation that from the patients' point of view the avoidance of unnecessary total immobilisation during an ED visit probably would be of importance and anxiety relieving.

It is most likely not an uncommon phenomenon that a leader role during a resuscitation in the ED is not clearly adopted, especially if a senior MD is not present. However, it can be assumed to be beneficial if a member of the permanent health care personnel with sufficient knowledge in terms of advanced life support (ALS) and familiarity with the policies of the

institute, should take over the leading role. Gilligan et al. (2005) studied, in a simulated cardiac arrest situation, the leading performances of ALS trained nurses compared with senior house officers with and without formal ALS training. ALS trained nurses performed as well as ALS and non-ALS trained senior house officers. Additionally, the nurses had greater awareness of the potentially reversible causes of cardiac arrest, and on those grounds a suggestion is given that if a well-enough experienced senior MD is not available to lead leading the resuscitation, it may be appropriate that experienced ALS trained nursing personnel take over the team leadership role. This study does not, on the other hand, commit itself in the case of a situation, probably not too uncommon in our domestic circumstances, when there are no experienced ALS trained permanent nursing personnel available, either, and possibly only newly recruited novices.

As cardiovascular diseases are such a major problem in the developed countries, advances in the care of one of its main manifestations, coronary heart disease (CHD), may have a large impact at both individual and societal level, and research around this phenomenon has appeared to be active. As has already been mentioned, the triaging nurse is one of the key-personnel for detecting patients with signs and symptoms of an impending coronary event and, above all, acute myocardial infarction (AMI). In the United Kingdom the Department of Health has declared that 75% of eligible patients diagnosed with AMI should receive thrombolysis within 20 minutes of arrival in the ED (Loveridge 2004). One way of approaching this ambitious goal has been the consideration of nurse initiated thrombolysis (NIT). Loveridge (2004) states that five studies reviewed for the article demonstrated the effect of NIT in reducing delays for thrombolysis. However, the focus in these studies was on the speed of thrombolysis and not fully on the safety and efficacy of NIT. Furthermore, articles published in Heart (Wilmhurst et al. 2000) and the British Medical Journal (Qasim et al. 2002) debate in favour of NIT. It seems reasonable, however, to emphasise that in the latter study the NIT was implemented by specially trained coronary care nurses after their knowledge and clinical skills had been thoroughly assessed by a consultant cardiologist.

Favourable outcomes of NIT have also been reported by Väisänen et al. (2005) in the form of two cases where a ship's nurse has undertaken the thrombolysis of an impending AMI complicated by ventricular fibrillation. In these two high-risk situations the ship's nurse utilised on-line emergency physician consultation.

Loveridge (2004), in turn, conducted a study, where the emphasis was places above all on clinical decision making skills and nursing diagnostics, even though there seemed to be a reluctance to use the concept of 'diagnostics' in relation to nurse-performed clinical patient assessment. ECG interpretation skills were especially assessed, as both the medical consultant and the researcher agreed that the ECG interpretations had to be accurate enough to be acceptable for actual patient records and in a court of law. As a conclusion of the findings, Loveridge states that NIT cannot be put to practice at present because ECG interpretation skills as well as diagnostic and thrombolysis decisions need to be improved. Currently, the availability and feasibility of other methods of reperfusion therapy in the form of percutaneous coronary intervention (Väisänen 2005) in an impending AMI probably makes the decision-making, in terms of the patient selection to one of these possible treatment methods, even more complicated.

The clinical effectiveness and costs of minor injury services (MIU) provided by nurse practitioners compared with the same kind of patients treated in an ED were studied by Sakr et al. (2003). As a conclusion the authors state that a nurse practitioner-led MIU can provide safe and effective care for patients with minor injuries, but this comes at an expense as there seems to then be an increased use of outpatient services.

2.2.5 Competence, and competence assessment

Detecting possible abnormalities in patients' vital signs and an appropriate response to what has been observed are ED nurses' main assets. Failure to detect or respond to such abnormalities can result in delayed management and increased likelihood of more severe morbidity (Cioffi et al. 2006). The authors conducted a study with the aim of exploring and describing clinicians' responses to abnormal vital signs (AVS) in a busy ED. In conclusion it was stated that environmental and human factors like issues with documentation and ineffective communication contribute to inappropriate delays in the responses to AVS. It seems unjustified to assume that the situation in Finnish EDs would differ significantly from these findings. These factors can, on the other hand, be acted on by educational interventions and enhanced communication, as has been demonstrated by Mason et al. (2005) when assessing clinical competence in an objective fashion. They used an Objective Structured Clinical Examination assessment, which turned out to work well and provide a framework for competence assessment that can be compared over time between individual practitioners and departments.

Yet, as Meretoja et al. (2004) point out, there are only a few studies comparing nurse competence in different hospital work environments. According to the authors, nurses reported their overall self-assessed level of competence as good. They felt themselves to be most competent in the areas of managing situations, diagnostic functions and the helping role. Least competence was expressed in ensuring quality. Nurse competence profiles differed between work environments in terms of both the level of and frequency in using competencies between work environments. Albeit this study was not dealing merely with ED nursing, at least some directional conclusions are justified for ED nursing purposes.

2.2.6 Aspects of emergency nursing by experts' assessments

The purpose of the final part of the literature survey is to provide a short summary of the research in ED nursing conducted by Delphi- technique. A synopsis of main characteristics of Delphi- technique is given in the next chapter, albeit a more profound description of the method applied in this study will follow later. As long as systematic activities have existed, human beings have possessed the urge to look into the future. Oracles and fortune-tellers have had a permanent position throughout earlier cultures. One feature characteristic of exact sciences is the enabling of accurate predictions of nature's events. But only recently have systematic futures' study come to encompass a significant aspect of the image of the sciences (von Wright 2007).

For the purpose of serving the aforementioned purposes, Delphi technique is described as a widely used predictive process attempting to elicit expert opinion in a systematic manner for useful results (Sackman 1975, Rescher 1998). Delphi utilises a group, comprising individuals in a communication process such that the process is effective and complicated problems can be dealt with (Linstone and Turoff 1975, Kuusi 2003). In 1994, McKenna commented on Delphi- technique as having a number advantages over the more common research methods, and having potential for enhancing nursing knowledge on a range of important patient care issues (McKenna 1994). Delphi technique has been related to the anticipation of technological development, but lately it has been utilised largely in the anticipation of educational needs, including future requirements within health care (Kuusi 2002, Myllylä 2007).

The aspiration to identify research priorities among ED nurses holding different clinical positions appeared to be obvious. The chief clinical issues turned out to be pain management, triage and trauma and ED violence, which led Meuleners et al. to name the phenomenom as the changing role of EDs. (Heartfield 2000, Bayley et al. 2004, Meuleners et al. 2004).

Physical and verbal abuse from patients and acuity of patient presentations seemed to be increasing steadily.

Stress-producing factors reported by nurses attending serious incidents, and family presence during paediatric cardiopulmonary resuscitation CPR were revealed by Dwyer (1996) and Henderson and Knapp (2006). The rankings of nurses' self-reported stress-producing factors appeared to be dependent on the duration of nursing experience of the respondent. The more experienced group nominated anxiety about nursing a family member or close friend as the most significant source of stress. The less experienced group, in turn, reported concern about nursing a child as the most important stress-producer.

3 The purpose and research questions of the study

The purpose of this study was to reveal and describe the current, and anticipate the future operational and educational requirements with special reference to ED nurses' clinical skills. The time frame was set to the year 2020. When dealing with issues related to operational policy and especially education, it has to be targeted to the future. The year 2020 was approximately 15 years ahead at the moment of this scientific inquiry, and might be considered sufficient for educational and political reformations to realize, should they turn out to be desirable and feasible.

The study aims first at revealing the attributes of the concept of clinical skill, secondly at producing information concerning the prevailing situation in terms of the level of the skills, and thirdly at outlining the preferable and probable future of ED nursing. The premises of this study are largely empirically-originated. On grounds of the clinical experience of the researcher as well as the contemporary and future challenges demonstrated in the foregoing, the aims are pursued by exploring experts' perceptions of the four research questions, which were specified as follows:

I: What kinds of clinical skills are currently required from ED nurses?

II: At what level are the clinical skills of ED nurses currently?

III: What will the operational environment for future ED nurses be like?

IV: What kinds of clinical skills will be required from ED nurses in 2020?

The study produces futurological knowledge based on experts' perceptions of the future, i.e. perceptional knowledge (Malaska 2001) and thus, it aspires to provide the means for visionary management by political, educational and other decision-makers (Kaivo-Oja et al. 2004). Ultimately, the aim is to aid at providing quality ED nursing in relation to the needs of acutely ill and injured patients at any given time.

The main focus is set on the clinical skills of ED nurses. In addition, on the background there are deliberations (for example centralisation of emergency health care services, nurses' education, and nurses' possibly increasing responsibilities) having effect on the research phenomenom.

4 Ontological, epistemological, and methodological commitments

4.1 The scientific underpinnings with reference to futures' research

This study belongs to the domain of clinical nursing, and methodologically to futures' research (Bell 1997a, Slaughter 1999, Malaska 2001). The ontology of the study is committed to the basic assumptions of futures' studies. According to them alternative futures exist, and human beings themselves can, by the decisions they make in the present, have an impact on the impending future (Masini 2006). The goal of futures' studies, this research included, is not to predict the future, but to improve it and challenge fatalism (Cornish 2004). A strong argument in favour of the rationale for executing futures' research can be adopted for the purposes of clinical nursing science from Lombardo (2006).

Wendell Bell also expresses himself to be committed to these fundamentals – the investigation of possible, probable and preferable (or desirable) futures – as the scope and purpose of futures studies, not forgetting that past trends and current trends are, nevertheless, central (Bell 2002). As Serra (2006) points out, these commitments are, not infrequently, referred to the discussion within futures studies in the form of an ethical obligation of futurists being the pursuit of a better future. Serra argues these basic assumptions and presents the real objectives of futures studies to be the promotion of information about future events in order to ground present decisions. This, in turn, does not translate as prediction, as prediction may imply knowing all the future possibilities and being certain of what will happen. Futures studies have to settle for less. However, it often turns out to be that less is more, and the futures studies do not expect to uncover all the future alternatives. Thus, the three scenarios of this study were constructed to cover only three alternative futures among the indefinite range of possible futures. The aim is to recognise the portion of the future relevant to the decision under consideration, and to understand what this may lead to (Serra 2006).

A fundamental question has been raised within futures' studies: why should futurists know the future better than anyone else? The answer, even though probably not satisfactory for all, refers back to the fundamentals of futures studies, as they are not really attempting to know the future, but to have impact on current decision-making and anticipate what will then happen (Kuusi 1996, Mannermaa 1999). These are the purposes of this study, as well, and this allows us to define the cognitive interests of this study to be emancipatory and hermeneutical.

The aim is both to reveal the perceptions of expert stakeholders and manifest them to the consciousness of the reader for evaluation. Furthermore, the intention is to understand, mediate and interpret those perceptions (Eriksson 2003, Willmott 2003).

Another central issue deals with our perception of the existence of so-called possible worlds, and how complexity brings forth new attributes. The keystone of epistemology of futures studies, in turn, concerns the particular nature of the knowledge of futures and the relationships between other ways of knowing and, especially the relationships between other disciplines. The methods of futures' research simultaneously serve as epistemological standpoints, as through those methods it is intended to obtain knowledge about the future (Kamppinen and Malaska 2002).

The knowledge of future is built upon present objective knowledge and the perceptional knowledge of the past in a way that, with the aid of mental images a third component of knowledge, perceptional knowledge, is introduced to illuminate new meanings, values, changes and emerging possibilities. Perceptional knowledge (Figure 5) is a generalised perception of knowledge, which contains, as its narrowest special case, interpretive and objective knowledge (Malaska 2001). Within the domain of futures research, particular methods for producing perceptional knowledge in particular have been developed, e.g. Delphi and scenario technique, which are applied in his study (Kamppinen and Malaska 2002).

According to Kant, the future can be affected by actions taken in the present (Kamppinen and Malaska 2002). According to Niiniluoto the philosophy behind futures' research is a perception of a human being as an active constructor of his or her own life (Niiniluoto 2003). Even though the aforementioned seems to resemble the concept of social constructionism (Schwandt 2000, Raatikainen 2004, Kakkuri-Knuuttila and Heinlahti 2006), both Niiniluoto (2003) and Bell (1997a) favour scientific critical realism as an adequate theory of knowledge for futures' studies. Niiniluoto's variant of scientific critical realism is based on the correspondence theory of truth. According to Bell (1997a), critical realism can incorporate within the same epistemology truth assertions both about the evidential past and present, and about nonexistent and non-evidential future. On these grounds scientific critical realism is adopted to serve as the background theory of this study.

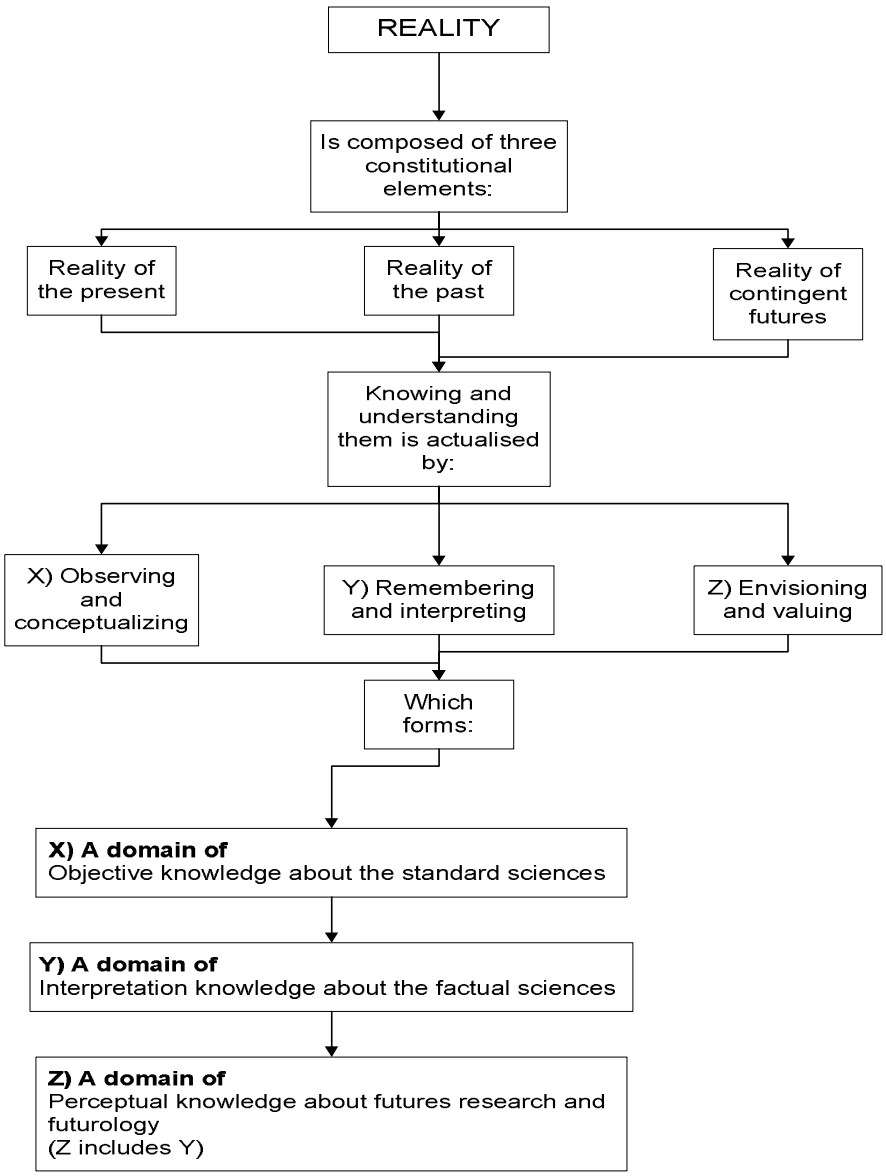

FIGURE 5. A schematic outline of the understanding of futures' knowledge as a generalisation of scientific knowledge by Malaska (2001), modified by the researcher.

4.2 The scientific underpinnings with reference to nursing theory

Nursing theories aid in producing knowledge in order to develop professional practice by describing, explaining, forecasting and controlling phenomena (Marriner-Tomey 1994). Several philosophies and nursing theories have been proposed to serve as framework for

emergency nursing, e.g. Henderson's philosophy, the middle-range theory of Orlando-Pelletier, and the grand theories of King, Orem and Roy (Hughes 1983). However, none of them seems to have gained a predominant acceptance among emergency nurses worldwide. The philosophy of Ernestine Wiedenbach emphasises the skill of helping in clinical nursing, the *helping art of clinical nursing* (Sitzman and Eichelberger 2004), and which, despite its weaknesses, might serve as theoretical basis for further development. Especially, the emphasis that Wiedenbach has placed on requirements of nurses' theoretical knowledge of the natural sciences and their ability to assess patient's clinical condition and need of care, is worth noticing. The four elements of clinical nursing, defined by Wiedenbach, are not in contradiction with the background assumptions of this study. These elements of clinical nursing presented by Wiedenbach are: philosophy, purpose, practice and art (Sitzman and Eichelberger 2004). On the other hand, the concept of need of help is based on the fact that the patient themselves has to recognise the need of help. Thus, this concept cannot be applied to unconscious or physiologically or mentally disabled people. This inevitably reduces the feasibility of applying this philosophy to emergency nursing (Danko et al. 1994). Yet, the philosophy of Wiedenbach serves as a background, albeit remote and misty, to this clinical nursing study.

Eriksson et al. (2000) have summarised the conceptual framework of nursing. It is based on an ancient idea of nursing as both art and science. The 'head' represents logical, systematic thinking, as in nursing science. The 'heart' refers to the ethical component of nursing, and the 'hand', in turn, refers to art and beauty. It can be compared to techno-ethics, or good technology, which is more than just plain technique. The concept in the focus of this study, clinical skill, is considered to be consisted of and derived from these three components as well.

4.3 The application of Delphi- method used

This study aims at producing perceptional knowledge (Malaska 2001) of the future, and argumentation between different stakeholders involved in the issue of ED care of acutely ill and injured people. The concept of *proxy-argument* is of vital importance for Argument Delphi- technique. According to Kuusi, a proxy-argument is for example a statement that *'The spreading of a certain technical innovation is inhibited by technological problems'*. This statement is not telling what the technological problems actually are, and thus does not enhance the comprehension of the listener. Proxy-arguments, as opposite to real arguments,

do not carry a truth value in themselves. They can be either true, or false. A person presenting proxy-arguments, functions as though reasoning for his argument, but leaves it untold. One mission of an Argument Delphi- study is to reveal the relationships lying behind proxy-arguments. Argument Delphi- technique systematically investigates whether there are real causalities behind the arguments expressed (Kuusi 2002, Myllylä 2007). Considering these starting points, an application of Delphi- technique approaching Argument Delphi (Kuusi 1999, 2003) technique appears to offer an appropriate solution for the empirical part of this research. The application of Delphi- technique used consisted of four repeated surveys (Heikkilä 2008) utilising Delphi- technique having close resemblance with Argument Delphi-technique.

According to Turoff (1975), the original Delphi- method as applied in its infancy, tended to seek consensus among homogeneous groups of experts. As a significant departure from its roots, the Policy Delphi seeks to generate and thus elicit the strongest possible opposing views concerning the potential resolutions of a policy issue. Argument Delphi- technique, in turn, was developed by Kuusi as a variant of the Policy Delphi- method (Korhonen-Yrjänheikki 2004) on the basis of experience gained from research projects aiming at anticipating and estimating future technological development (The Parliament of Finland 2001). Jauhiainen (2004) states that in an Argument Delphi- study, experts express their estimations in terms of the desirability or feasibility of various alternative solutions and the importance and validity of the arguments expressed.

Kuusi (1999, 2003) points out issues especially relevant to the Argument Delphi- technique as follows: 1) A Delphi panel is gathered from among experts; 2) The experts' assessments of future development are revealed for argumentation instead of previously emphasised pursuit of forecasting future events; 3) Instead of aiming at consensus, contradictions stemming from deviating interests, values and different psychic characteristics are raised; 4) The arguments concerning background of the opinions are highlighted; 5) The anonymity of the panellists is maintained during the argumentation phase, but the panellists know about each other; 7) All keystone stakeholders in terms of the issue(s) in the focus of the research should be represented in the panel; 8) When using methods based on utilising experts it is of utmost importance to realise, that the quality of experts chosen matters more than the number of them; 9) The pursuit of achieving a picture as versatile and realistic as possible of the problem under investigation prevails, by selecting panellists whose expertise complements each other;

10) The aim is not to obtain statistically representative groups of opinions, but to bring important topics, relevant to the issue(s) in the focus of the research, under assessment; and 11) Finding new and meaningful framings of questions.

Every future topic can be viewed from the perspectives of predictive, option and commitment reasonability. However, different types of reasonability are relevant in different situations. When panellists may have an impact on the anticipated future, but they may lack relevant decision alternatives or relevant future options, the option reasonability is said to dominate in the argumentation and in the making of judgements. As the mandate of this study is considered to be the making of a survey of the possibilities for alternative futures of ED nursing in 2020, option reasonability is the main focus of this study. This, in turn, leads to the main success criterion to be 'the total epistemic value of the exposed new rational options and arguments to the relevant actors' (Kuusi 1999). With reference to Korhonen-Yrjänheikki (2004), the research approach utilised in this Delphi study can be claimed to be hermeneutical, as the aim, in addition to some quantitative objects, is to secure experts' arguments about the futures they have chosen as probable and desirable, and to detect the pathways to alternative futures. Bringing this argumentation under scrutiny may enhance the comprehension of different stakeholders and so enable relevant discussion between them.

There does not exist one particularly orthodox way of implementing any Delphi- method (Korhonen-Yrjänheikki 2004). This study was conducted approaching Argument Delphi-technique (Figure 6) with repeated surveys in a way that leaves the iteration of the same respondents to a minor, but not an unremarkable, role. However, three main features are mentioned to be characteristic for all Delphi methods: anonymity, iteration and feedback (Kuusi 2002). The rule of these three main characteristics have been obeyed in this study. The respondents were anonymous in terms of each other. It must in any case be added that the Delphi panellists during the third round of the study knew about the other panellists, but not their responses. Iteration in a Delphi- study means that a Delphi- study contains several rounds during which the experts are offered the possibility to correct their statements. This has been partially realised as three of the participants took part in all four rounds, and several respondents in three rounds of the study. They gave their responses to items and questions that to some extent were the same during all rounds. This requirement was not, however, totally fulfilled. The requirement of feedback was either not totally fulfilled because the participants did not receive any straightforward feedback until after the third Delphi- round.

This was due the structure of the study, as the questionnaire by which the data during the second round were collected was partially based on the results of the first round conducted in the form of semi-structured interviews and analysed by methods of qualitative content analysis. Appendix 7 demonstrates the mind map that was constructed from the ultimate outcome of the I Delphi- round (Figure 11). The statements of the first part of the questionnaire created for the II Delphi- round were logically derived from this mind map. Furthermore, the data during the third round were again collected by means of a questionnaire, which was partially based on the results of the first and especially the second round. Thus, even though the panellists were not offered feedback by which to correct their statements until during the IV round, their responses and arguments had a direct influence on the structuring and content of the next Delphi round. To summarize the methodological premises, the researcher-made modifications to original Delphi method and adopted features of Kuusi' s Argument Delphi- technique, the research method is hence called Delphi-technique.

In this study, the definition of the concept of *scenario* is adopted from Mendonça (2001), according to whom scenarios are seen as translator devices for the findings of social theory. They have the potential of creating theory, facts and social science methods useful for corporate management. Even though Mendonça connects the use of scenarios to corporate management, this probably does not rule out using them also within the domain of public health care as an integral part of the strategic planning process, and strategic planning unquestionably has been adopted as an essential component of modern health care (Mendonca 2001).

According to the advice provided by the developer of the Argument Delphi- technique, Osmo Kuusi, the panel should be gathered so that all the relevant interest groups as well as fields of expertise, in terms of the research phenomenon in focus, are covered from different angles, and that a versatile range of, even contradictory, interests are represented. In order to fulfil this requirement, a matrix of interest groups and expertise sought was outlined (Appendix 8). The matrix was applied during the III, and participants of the IV Delphi- round were also derived from it. Moreover, the same ideology in assembling the informants has been obeyed during the I and II round, as well.

This final stage of description of the method of scientific inquiry used deals with the time range chosen for this study. In the light of the Futures' research literature, the answer to the

fundamental question: 'How far ahead is future?' seems to be: 'It depends' (Brier 2005). Even though the answer is completed with the addition 'It depends on the topic under study', this kind of vagueness is probably not sufficient for academic and scientific purposes. As all Futures' research is interested in time-related phenomena, it may be regarded as somehow surprising that a generally accepted and prevailing unanimity of the definition of time ranges does not seem to exist. On the other hand, as Kamppinen (2000) points out referring to the ethno-chronographic approach, extremely short and long periods of time are very difficult for human understanding to deal with. To support this claim, Kamppinen refers to an ethno-chronographic survey in which most people viewed the present moment to last from one to 20 seconds. This, in turn, is probably far shorter than Futures researchers are accustomed to dealing with.

The perceptions of Futures' researchers' in terms of the time ranges are variable. Kaivo-oja et al. (2004) recognise three time-frames connected with decision-making and management as follows: In operative or operational management the time range is up to one year, in strategic management up to ten years, and in visionary management up to 30 or even 50 years.

Mannermaa (1999) states that the concept of a very long time range varies according to the discipline and the problem area it is dealing with. Within the information industry as little as five years can be a very long time range, while within urban planning a perspective of 50 years can be regarded as such.

Brier (2005), in turn, cites several other Futures researchers' conceptions of the time ranges as he presents the time categories in the following way: Near term future - up to one year from now, short range future - one to five years from now, middle range future - five to twenty years from now, long range future - twenty to fifty years from now, and far future - fifty plus years from now.

Passig (2003) also refers to other scientists, when describing time ranges. According to the model presented by him, the immediate range is up to five years, short range five to ten years, median range ten to thirty years, long range thirty to fifty years, and a very long range fifty to one hundred years.

In Finland, The Research and Development Centre for Welfare and Health has considered 20 years time frame to present long range future (Sinkkonen 2006). In this study the anticipation reaches out to the year 2020 and is named the long range future. From the time of data

collection phases it is approximately 15 years ahead and thus fits into the time range of visionary management presented earlier by Kaivo-oja et al. (2004). As one of the main purposes of this study is to provide perceptual knowledge for the purposes of visionary management, this policy seems justified and reasonable.

Finally, it seems appropriate to remark that all Futures' researches have not tied themselves down to these more or less exact time ranges. Ono explains himself as seeing the Future as a moving target toward which our behaviours and actions are synthesised. He also refuses to see any importance in setting a specific year in the Future as a fixed target when talking about scientific work (Brier 2005).

4.4 Sequential triangulation

In nursing science, the use of both qualitative and quantitative research methods in the same study is not uncommon (Holloway and Wheeler 2002). Even though the use of these two methods, with their different philosophical underpinnings, is often described as mutually exclusive, the use of mixed-methods has also been demonstrated to be beneficial. Using qualitative and quantitative data has allowed triangulation of factors in the focus of the study, and has thereby reduced bias and increased validity. When combining the qualitative and quantitative paradigms in a complementary fashion, a deeper understanding has been claimed to be obtained in terms of the factors pursued in the study (Yauch and Steudel 2003). Kivipelto (2006) refers to Lindsay (2002) when pointing out that quantitative methods enable the documentation and recognition of issues, while qualitative methods enhance taking the research findings into practice. However, the debate around the use of triangulation has not been totally resolved (Holloway and Wheeler 2002).

According to Leino-Kilpi (1998), from the point of view of the development of the discipline it might be neither wise nor possible to merge the grounds of different research philosophies. Instead, the nature of the issue in the focus of the study may require the use of various methods. In this way there exists an aspiration to increase knowledge and understanding by searching, simultaneously or sequentially, for more different kinds of information concerning the issues in focus. This is the way in which triangulation works (Leino-Kilpi 1998), and was applied in sequential form with repeated surveys in this study.

The ultimate aim of this study, however, is to provide a basis for convergence on the truth by using multiple methods and perspectives. It is striven for by sorting the information gathered

in order to enhance the credibility of the findings (Polit and Beck 2004). Triangulation is claimed to be justified if the aim is to elicit the perceptions of those people who otherwise would remain unheard (Kivipelto 2006). This is, without doubt, the case in this study. All in all, it seems most reasonable to respect the suggestions of Leino-Kilpi (1998) and Holloway and Wheeler (2002) that only researchers experienced in both qualitative and quantitative methods should use triangulation.

5 Materials and methods

A summary of the progress of the research project according to the research question and phase, the study population, method of data collection, method of data analyses, and timing, is provided below in Figure 6.

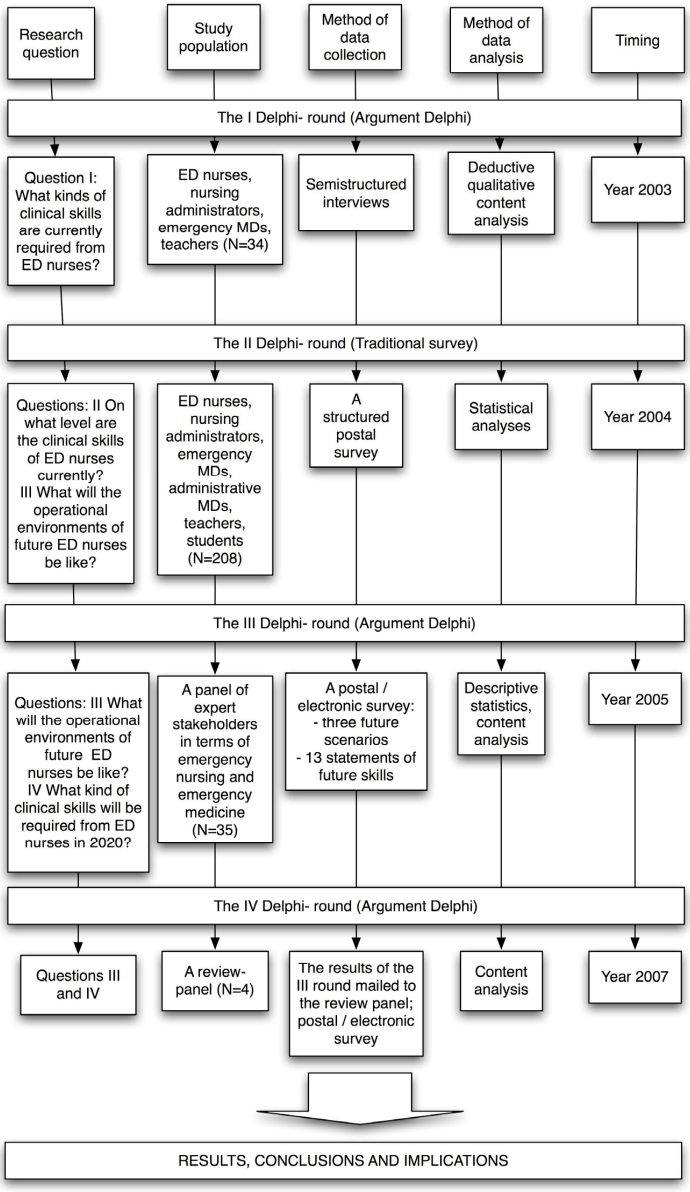

FIGURE 6. The research process.

Neither a list of the themes of the thematic interviews nor the questionnaires used have not been attached to this thesis due to their remarkable length. They are, however, available from the researcher.

5.1 The first Delphi round

The aim of the I Delphi- round was to map the future (Kuusi and Kamppinen 2002), and to find essential themes and arguments to proceed from in the subsequent phases of the study. Thus, methodologically the I Delphi- round was conducted according to the principles of Argument Delphi (Kuusi 2002). The explicit purpose was to obtain answer to the first research question (Figure 6).

5.1.1 Data collection

The data collection during the first phase (Figure 6) was conducted utilising semi-structured interviews (Cohen et al. 2000, Polit and Beck 2004). This method was chosen because it was considered desirable to have certain specific topics covered comprehensively. It was thus known what the questions to be asked were, but the answers could not be anticipated. The topics to be covered were compiled on the basis of both the literature survey and the pre-understanding as well as clinical experience of the researcher (see Hopia et al. 2006). Thus, a written list of questions that were asked of every respondent in the same order, was prepared. The list was sent to the respondents beforehand in order to give them a chance to orientate to the topics. Technical problems of unknown origin with e-mail appeared in connection with two respondents and the list of questions did not reach them before the interview took place. The preliminary list was piloted by conducting two pilot interviews to two nursing students in order to ascertain the functionality of the recording machine and the list of questions. Minor adjustments to the questions were made on the basis of the pilot interviews. Due to complicated accessibility and emerging difficulties with timetables, two interviews had to be conducted via telephone. All the interviews were recorded, with oral permissions from the respondents.

The purpose of the researcher was to have certain informants interviewed regardless of possible data saturation, and the sample size was determined based on informational needs (Polit and Beck 2004). One latent aim of the interviews was to assess the availability and feasibility of the respondents for the later purposes of the Delphi- panel. Several informants were actually recruited for this purpose in the third phase of the study. Yet, taking this latent

purpose into consideration brought into being quite a large number of interviews, and the propriety and usefulness of so many interviews made in different parts of the country can with good reason be questioned. Even though it might have been ideal to obtain informants so that the geographical coverage would have been more thorough, it was not possible for practical, i.e. economic reasons, and would also have been too time-consuming.

Selection of the informants was made by the researcher, using purposive sampling technique (Denzin and Lincoln 2000, Polit and Beck 2004). As Nyman (2006) points out, the selection criteria of all the informants was the same – that is, they were considered on the basis of their occupational duties and / or position to possess expert-level knowledge, understanding and experience of the issues related to research question I. When thinking about the first research question it was obvious that the informants should be experts either in terms of clinical or educational emergency nursing or emergency medical care. Even though this study is tightly connected to clinical nursing, it was considered appropriate and useful to obtain a wider perspective on the issues in focus, with a resemblance of the clinical circumstances, i.e. multi-professionally. Thus, major interest groups and competencies (nurses and MDs) as well as the view of administration (unit managers and nursing directors) and education (teachers and instructors) were to be covered. All in all, with reference to Kuusi (1999), the information policy issues had to be kept in mind, i.e. different expert groups in organisations may have different interests in sharing information. This being the case, the researcher personally conducted all the interviews, and informed consent was obtained at the same time as the time and place of the interview was agreed on. In one hospital's ED the unit manager selected some of the nurses to be interviewed among those on the shift. The selection criteria applied was that the nurses should have at least one year's experience and that they were willing to participate. Informed consent was obtained from them also. This arrangement was due the quickly changing workload in the ED at the time when it was agreed on with the unit manager that the interviews would take place. In all other hospitals the researcher suggested the nurses to be interviewed and the unit manager asked them for their approval. Then the time for the interviews was chosen, and the nurses were able to participate during their working hours. A quiet and private place was sought in order to avoid disturbances as well as to minimise the possibly existing fear of being overheard heard during the interview. It remains unknown whether this was an issue at all, but the author received the impression that the respondents did not hesitate to speak freely.

The final sample (N=34) comprised 13 ED nurses, four ED unit managers, three directors of nursing responsible for their hospital's ED, three instructors of pre-hospital emergency medical care from the Emergency Services College of the state, two lecturers from Arcada University of Applied Sciences, seven MDs with a background of pre-hospital emergency medicine, and two chief physicians responsible for their hospital's ED. The respondents represented four hospitals of specialised medical care, two large EMS systems, and two educational organisations. The distribution according to the respondents' gender was 19 females and 15 males.

The range of duration of the interviews was from 25 to 125 minutes. The recorded material was transcribed verbatim by a professional secretary, and 269 pages of A4 sized material written with a 12 point font at 1.5 line spacing was produced. Thus the mean of written material produced by one interview was 7.8 pages. Even though qualitative content analysis does not deal with figures, it is considered appropriate and useful to describe the material produced by the interviews with some figures in order to enable the reader to obtain some kind of perception and general impression of the material analysed as a whole.

5.1.2 Analysis of the data

The analysis began with reading the whole material through several times so as to achieve a general impression of the workload, together with both the usefulness and feasibility of the transcriptions in terms of producing answer to research question I. The actual analysis was conducted using deductive content analysis (Kyngäs and Vanhanen 1999, Pope et al. 2000, Polit and Beck 2004). As the interviews were conducted according to the pre-planned list of questions, it was considered appropriate to use the list as the framework for the analysis.

The researcher decided to analyse the manifest content of the transcriptions, and the unit to be analysed was defined to be a sentence, a combination of words or an entirety of thoughts (Latvala and Vanhanen-Nuutinen 2001). The next steps of the analysis were reduction and classification of the material, which were conducted by systematically searching for expressions in concordance with the analysis framework, i.e. the list of questions. At this point, the repeated reading over of the data was continued, bearing in mind the aforementioned choices made for the analysis unit and classification.

In the following phase the data was coded in order to enable sorting and categorising of the material (Holloway and Wheeler 2002). Following the coding, the researcher began to

examine the data according to the research question and phenomenom. The pathway of the analysing process is presented in the following outline (Figure 7):

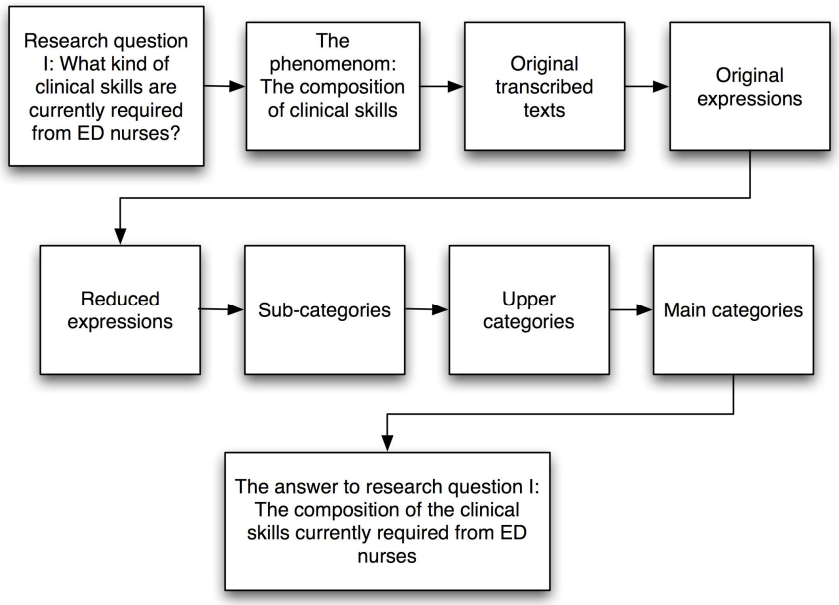

FIGURE 7. An outline of the analysing process of the transcribed data: research question I.

The utmost purpose of the qualitative content analysis process was to compress and conceptualise the data, and raise it to a higher level of abstraction (Silėn-Lipponen 2005). As described in Figure 7, the analysis of the transcribed data produced in relation to research question I was begun by searching for respondents' perceptions of the composition of the clinical skills currently required from ED nurses. This was named to be the phenomenom in the focus of this phase of the research. The aforementioned perceptions appeared according to the questions posed to the respondents during the interviews of the I Delphi round. As a result, the entire data were organised according to these questions, which were re-named as themes.

Furthermore, the themes were organised to form categories, i.e. contents having the same meaning were gathered together. These gatherings were then given names, which were actually reduced expressions from the original speech of the respondents. The reduced expressions, in turn, were gathered under a concept describing the meaning of the expressions, and were named to be sub-categories. All sub-categories, in turn, were combined

under an appropriate concept describing the essence of them, i.e. an upper category. Since one phenomenon consisted of several themes, all the upper categories deriving from abstraction of each theme were gathered to form main categories. The answer to research question one was, in turn, derived from the main categories.

The conclusive phase of the analysis of the verbal data was the construction of a mind map (Appendix 7) of the issues that could be raised from the attributes of the clinical skills currently required from ED nurses (Figure 11). This mind map served as the basis for the survey of the II Delphi- round, and the statements were logically derived from it.

5.2 The second Delphi round

The purpose of the second phase of the study was to acquire a wide expert perception of the level the clinical skills of ED nurses currently are on, and the what will the operational environments of future ED nurses be like. A less explicit aim was to reveal possible tension between the aforementioned professional groups, as was referred to in chapter 2.2.4 by Hukkanen and Vallimies-Patomäki (2005). Remaining committed to the method the intention was to compare the perceptions of nurses, nursing management i.e. unit managers and nursing directors, and MDs with this respect. These three groups were considered to form three Delphi sub-panels accordingly. Execution of the II Delphi- round obeyed classical survey (Heikkilä 2008).

5.2.1 Data collection

A tempting idea was to use some of the existing and validated measurement tools to provide the wider perspective sought after in terms of the current quality of clinical skills. Meretoja (2003) has published an extensively validated 'Nurse competence scale', Räisänen (2002) studied the level of knowledge and expertise how of persons graduating as nurses, and Leino-Kilpi has developed the Good Nursing Care Scale, which has also been profoundly validated (Leinonen et al. 2001, Rehnström et al. 2003, Ruotsalainen 2006). However, after acquainting with these measurement tools, and considering both the aims of this study and the futures research method chosen, a perception was developed that without a heavy re-formulating and merging of these already existing excellent tools it might not be possible to achieve exactly the goals aspired to. Whatever already existing measurement tool would have been introduced for the purposes of this study, the parts of the questionnaire dealing with the possibly

transforming requirements of clinical skills and the changing operational environment of futures ED nurses, would in every case have been needed to be prepared.

5.2.1.1 Issues on the background of developing the questionnaire

In addition, this study aims at enquiring very deeply into the core of current and future ED nursing, which, according to the clinical experience of the author as well as of the relevant literature, is tightly, albeit not exclusively, inclined to the skills of repeatedly assessing and re-assessing the clinical state of a patient in order to detect obvious or impending life-threatening problems in good time. The ability of ED nurses to react adequately to what has been detected during the assessment phase is another cornerstone of all emergency care, including emergency nursing. This claim is also validated by researcher's own clinical experience as well as the literature reviewed in chapter 2.2.

Even though it most certainly is true that only a minority of ED patients within somatic specialised medical care actually have life-threatening problems, the centralisation of these services may lead, or may already have led, to a situation where the waiting times are sometimes exceeding the safety level. Within emergency medical care, and especially when dealing with patients suffering from physical trauma, a concept of 'high index of suspicion' has throughout the years continuously been emphasised (Fleming et al. 1994, Narayan et al. 1994, Ivatury et al. 1994, Hunt et al. 1996, Maskery and Burrows 2002, Giss et al. 2006, Komanapalli et al. 2006, Zisis et al. 2006, Leonard et al. 2007). On the other hand, if an ED nurse has internalized the idea of "high index of suspicion" and is capable of assessing a patient reliably, it can be suggested that this may be beneficial for less urgent patients as well. The ability to assess a patient's clinical state reliably and to react adequately is transferable and applicable to almost any circumstances within nursing.

The currently valid description of the competence requirements for a nurse (Bachelor of Health Care), in terms of clinical nursing, bears, for example, the following statement: A nurse examines, assesses and maintains patients' vital functions: breathing, circulation and level of consciousness, the nurse masters the keystone procedures in terms of assessment and care, and the appropriate and safe use of equipment and devices, and conducts assessments and examinations with minor devices applicable to immediate care (Ministry of Education 2006). If the realisation of this statement is to be studied, it has to be operationalised, i.e. its components considered individually. In the questionnaire prepared for the purposes of this study, the process of patient assessment and reaction to what has been discovered has

intentionally been broken down into components, which, when put together, form the holistic phenomenon called clinical skill. The mind map (Appendix 6) constructed at the end of the I Delphi- round entailed these components and they were thus applied.

5.2.1.2 The questionnaire – measurement of the current situation

The questionnaire itself consisted of ten questions relating to common demographic and background data, 52 statements, derived from the mind map of the I Delphi- round (Appendix 6), concerning the level of ED nurses' clinical skills currently, 13 statements concerning the importance of the possibly transforming requirements of clinical skills of ED nurses, and the respondents were asked to give reasoning for their assessments. In addition, two open questions also dealing with the previous issues were presented, one question, where the respondents were asked to give suggestions for the concept to be used to represent what an ED nurse means, and 26 statements concerning the desirability and probability of future operational environment were presented as well. According to Kuusi (2001) a statement is a description of a possible state of affairs. It is true if the state of affairs is actual, or exists in the real world as stated, i.e. if it expresses a fact; otherwise it is false.

A decision was made to use visual analogic scale (VAS) to measure the respondents' perceptions of statements. VAS has been extensively tested as a tool for measuring a variety of subjective phenomena. When used properly, its psychometric properties, in terms of validity, reliability and sensitivity, have been demonstrated to be adequate for scientific purposes. Placement of the anchors and orientation of the VAS may vary, and it still continues to be valid (Gift 1989, Wewers and Lowe 1990, Cline et al. 1992, Miller and Ferris 1993, Collins et al. 1997, Pender and Looy 2004).

For the purposes of this study a horisontal line with length of 10 centimetres and right angle stops at the ends of the line was drawn. During the analysing phase, the centimetres were transformed to millimetres to avoid having to deal with decimals, e.g. a measurement of 6.5 centimetres was recorded as 65 (millimetres). The descriptive anchor phrases were placed beyond the right angle stops. The scale was unipolar, as the ratings of the intensity of the phenomenon in focus were from 'totally disagree' 'to totally agree' and 'insignificant' to 'very significant'. The recommendations of Wewers and Lowe were adopted here in order to make the use of the VAS as clear, unambiguous and easy as possible for the respondents, and to avoid the existing and undeniable risks of using the VAS (Wewers and Lowe 1990). The

respondents were asked to make a clear mark on the horizontal line at the exact spot which best describes their perception of the issue in the focus of the statement.

The main reason for using VAS, in addition to what has been explained from the respondents' point of view, was the desire to achieve a continuous variable to which the application of parametric statistics is possible (Meretoja 2003). Furthermore, the use of a continuous variable enables the transforming of the variable to ordinal scale should it for some reason turn out to be useful. The transformation is not possible in reverse (Nummenmaa 2004). A drawback to inclusion of the VAS technique applied was that all the VAS responses had to be measured manually by means of a ruler in order to obtain a numeric value to be taken to the SPSS software programme for analysis. This meant that a total of 13'728 manual measurements had to be undertaken.

It seems reasonable to point out that within the literature of nursing science there does not prevail a unanimous perception of the measurement level represented by VAS. In particular, Jakobsson (2004) has strongly opposed the use of VAS as an interval or ratio scale measurement. According to him, the scale cannot be considered to have consistent spacing between each scale step, and should therefore be treated as an ordinal scale, and thus non-parametric methods should be used. On the other hand, as Wewers and Lowe (1990) present, in the absence of objective reality it is presumably not wrong to consider VAS data to represent interval or ratio level measurement (Wewers and Lowe 1990). In this study, the VAS starts from 0 and ends at 10 (100 millimetres). With this unambiguous starting point, the VAS used could be regarded as a ratio scale. But it is a more complex issue to try to demonstrate that e.g. a VAS score of 80 represents twice as much disagreement than a VAS score of 40. Inevitably, some caution had to be executed when interpreting the statistical results (Miller and Ferris 1993).

5.2.1.3 The questionnaire – anticipating the future

The last part of the questionnaire consisted of statements or 'mini-scenarios' (Kuusi 2002) concerning the desirability and probability of the future operational environment. For this purpose, 26 statements were formulated based on the literature review, the preliminary results of the first phase of the study, and a general perception of the researcher in terms of evolution of the society. The last-mentioned refers to the deliberations on the background of the study and having effect on the research phenomenom, as explained in chapter 2.

Even though the qualitative content analysis was to be performed later, as the researcher had conducted all the interviews himself it was possible for a preliminary view and comprehension of the data to be mastered by the author. A matrix containing the statements and the alternatives to be chosen by the respondents was formulated, so that each of the 26 statements was followed by four alternative choices dealing both with the probability and desirability of the realisation of the issue of the statement. The alternatives to choose from were 'I consider this desirable and probable' (1); 'I consider this desirable, but improbable' (2); 'I consider this undesirable, but probable'(3); and 'I consider this undesirable and improbable'(4). The fifth alternative was 'I cannot decide' (0). Thus a discreet categorical variable was created, which had to be taken into consideration when planning the analyses of the results (Nummenmaa 2004). Non-parametric statistical tests were planned to be applied (Uhari and Nieminen 2001, Heikkilä 2004).

This kind of two-dimensional questionnaire implies a risk of being either unclear or ambiguous. However, it was a consent decision to take that risk, which was, after consulting a statistician and conducting a two-phased pilot survey, considered manageable and reasonable in proportion to the aims of this phase of the study. During the consultation with the statistician, a preliminary analysing plan was outlined. Several useful comments and suggestions were also provided for the author.

In the instruction of the future-oriented part of the questionnaire the respondents were asked to circle the figure representing the alternative best description of the respondent's perception. Special emphasis was asked to be placed on safety and flexibility concerning patients being treated in the ED when considering the alternatives.

5.2.1.4 Assembling the sub-panels

With reference to the purpose of the II Delphi round it was considered necessary to widen the group of stakeholders to be invited as respondents. A purposive sampling technique was again used (Denzin and Lincoln 2000, Polit and Beck 2004), because special expertise was sought. Thus, the final target group was defined to be as follows. 1) ED nurses' sub-panel: All ED nurses from seven EDs representing five hospital districts of somatic specialised medical care, 20 students of the educational programme for ED nurses' specialisation conducted by Arcada University of Applied Sciences, a sample of the members of The Finnish Association of Outpatient and Emergency Ward Nurses, and a sample of teachers and instructors involved with the education of pre-hospital and in-hospital emergency medical and nursing care. 2)

Sub-panel of nursing management: all the unit managers and nursing directors from the seven hospitals' EDs, as mentioned previously. 3) MDs' sub-panel: administrative chief physicians responsible for the EDs of the seven hospitals, and emergency physicians actively involved in pre-hospital emergency medical care.

The teachers and instructors to be selected as participants for this phase were the same as those already interviewed. In addition, a few more teachers with a background in emergency nursing were selected. The selection was made by the author, the inclusion criterion being an assumed or known mastery of the substance of emergency nursing.

The Finnish Association of Outpatient and Emergency Ward Nurses has several hundred members. Thus it was necessary to take a sample of them. After receiving the alphabetical name list of the members, a selection was made in the following way. It was decided to take a 10% sample with random sampling technique. The starting point for the selection was chosen by casting two dice. So the starting point was chosen between one and twelve. From the alphabetical name list the first name was selected by the die-cast technique, and all the other participants were selected by choosing every tenth name in the name list. The name list did not contain information concerning the work place of each member, only the place of residence. In order to avoid selecting the same persons as those working in the hospitals already recruited to the study, such persons were excluded whose place of residence turned out to be in the same city as where the hospitals already chosen were situated. In these situations the next name in the members' list was chosen. Two members living abroad could not be reached, and they were replaced by two new members next to their names. Two other members responded as no longer working in an ED, so they regarded themselves as not competent to participate, and they were also replaced through the aforementioned technique. One member returned the questionnaire with comments that she was not willing to fill such a long and difficult questionnaire. That return took place so late that a replacement respondent could not be selected.

This sampling technique applied yielded a sample that might be best described as well-reasoned purposive sample. The results of the II Delphi- round cannot be generalized to a larger population (Burnard 1995), or at least great caution should be exercised if doing so. However, purposive sampling can be applied even in quantitative study when the researcher considers useful to assemble a group of most representative and informative experts to act as key informants as was the case in this Delphi study (Polit and Beck 2004).

Despite the decision to apply purposive sampling technique the aim of the researcher was to obtain samples representing the population they were recruited from as reliably as possible. However, a major problem appeared to be soliciting the MDs' sub-panel. When considering the subject and purposes of the study it was assumed that the respondents should be well familiar of the true nature of ED work. On the other hand, such a group of MDs with formal education for such purposes does not exist in Finland yet. It was assumed that the group of emergency physicians, in addition to the administrative chief physicians responsible for their hospital' s ED of all seven hospitals recruited to participate, would yield a representative sample. As will be discussed later this assumption turned out to be incorrect, and caused problems with statistical analyses. The same was true with nursing directors, but for other reasons. To conclude, both MDs and nursing directors were clearly underrepresented and ED nurses overrepresented in the final sample. The inexperience of the researcher showed here, which will also be discussed later.

The selection of emergency physicians was conducted in collaboration with the medical supervisor of the study. As the inclusion criterion was active and on-going involvement in pre-hospital emergency medical care, the medical supervisor possessed a thorough knowledge of the Finnish emergency physicians' status in terms of the inclusion criterion. The list of participants within this group of emergency physicians was compiled according to the suggestion made by the medical supervisor.

5.2.1.5 Implementing the data collection of the II Delphi round

A pilot-study was conducted with the aid of two Universities of applied sciences, and 26 nurse-paramedic students being the respondents. They participated voluntarily, and special attention was asked to be paid to the assessment of clarity and unambiguousness of the questionnaire. Also, the time needed for answering was asked to be recorded. Several suggestions for enhancing the clarity of the questionnaire were made, and most of them were adopted. After the alterations were made to the questionnaire, two nursing students conducted another pilot study. However, no further changes resulted at this point.

A paper version, instead of an electronic one, was used for several reasons. First, the prevailing reality, where junk-mail and viruses along with the attachments of e-mail, pose a constant threat to the exchange of information via e-mail. Further, the researcher was not able to construct an electronic VAS for collecting the data. If the questionnaires would have been sent electronically to the respondents, they would have had to print it out anyway, complete

the questionnaire, and send it back to the author. This was considered too burdensome for the participants, and risky in terms of the response rate.

After consulting the nursing director responsible for the ED of each hospital involved, the researcher made an appointment with every ED unit manager in order to obtain a 45 minutes time-space in which to personally explain to the ED nursing personnel facts about the study, and to encourage them to participate. Hence the researcher paid a visit to all seven hospitals (five university hospital' s and two central hospital' s EDs) as to explain the facts and deliver the questionnaires to each ED. It was agreed with the unit managers where the ED nurses could pick up the questionnaires, where the box for the responses was to be held, and when and how the boxes containing the questionnaires were to be returned. The unit managers also promised to encourage the staff to participate, which, however, was voluntary and anonymous. Furthermore, in most hospitals the ED unit managers promised to deliver the questionnaire to the director of nursing and administrative chief physician. All in all, a total of 420 questionnaires were delivered. All the mailed questionnaires were accompanied by a return envelope with author's address and stamp on it.

5.2.2 Background of the sub-panellists

ED nurses' mean age was ten years less than nursing managers' and MDs', but all sub-panels can be regarded as experienced health care professionals. The mean health care working experience of ED nurses was over 13 years, while among nursing managers it was more than 25 and among MDs' almost 23 years (Table 3). However, one member of the ED nurses sub-panel had only five months of health care and no more than one month of ED working experience. Central or university hospital was the workplace of majority of all the sub-panellists, as 89.2% of ED nurses, 93.3% of nursing management, and 73.1% of MDs were recruited from these institutes.

Within the sub-panels medical/surgical nursing was the most popular specialisation of ED nurses with a proportion of 55.7%, while nurse paramedics and nurses with acute nursing as the main area of specialisation represented 13.2%. Nurse managers had an education of medical/surgical nurse, as well (80% of the sub-panel). Respectively, anaesthesiologists were distinctly the largest group of MDs with the frequency of 18 representing 69.2% of the MDs' sub-panel.

TABLE 3. Background of the three sub-panels according to age, gender, health care working experience (months), and health care working experience (years).

Sub-panel (n)	Age (years)			Gender freq., (percentage of all in this sub-panel)		Health care working experience (months)		Health care working experience (years)
	- mean	- 95% Confidence Interval of mean, lower bound, upper bound	- min., max.	- female	- male	- mean	- 95% Confidence Interval of mean, lower bound, upper bound	- mean
ED nurses (n=167)	38.3	36.74, 39.85	22, 60	133, (79.6%)	32, (19.2%)	165	146.08, 183.61	13.8
Nursing management (n=15)	49.3	45.02, 53.65	36, 59	11, (73.3%)	4, (26.7%)	306	252.30, 359.36	25.5
MDs (n=26)	47.7	45.11, 50.20	34, 58	5, (19.2%)	21, (80.8%)	273	222.18, 324.96	22.8

5.2.3 Analyses of the data

The data gathered in the second phase were processed and analysed using SPSS for Windows software, release 11.5, 13.0 and SPSS for Mac, release 16.01. First, the author became acquainted with the data by observing the descriptive statistics (frequency and percentage distributions, means, medians, standard deviations, range) of the variables according to each sub-panel. However, when it was realized that the amount of responses from representatives of the sub-panels of nursing management (N=15) and MDs (N=26) remained low yielding samples too small for advanced statistics to be applied, a new plan had to be outlined. It turned out to be clear that the data obtained from the three sub-panels could only be compared applying cross-tabulations with χ^2 and Fisher' s exact test (Heikkilä 2008). One of the assumptions Fisher' s exact test is based on is random sampling, or the data must at least be representative of a larger population (Motulsky 1995). Even though it was previously stated that due to the purposive sampling technique applied the results of the II Delphi- round should not be generalized to larger populations, a consultation of a statistician confirmed that applying Fisher' s exact test here was not incorrect. With all the statistical tests conducted in the study results having a two-sided p-value equal to or less than 0.05 were considered statistically significant (Räihä et al. 2006, Heikkilä 2008).

Due to the aforementioned reverse all the data obtained with VAS measurements had to be transformed to discontinuous form. As the original intention was to compare the perceptions of the three sub-panels in terms of the statements that were constructed to reveal to what extent the participants agree or disagree with the items expressed in each statement. At this time it was made a decision, which inevitable might seem somewhat arbitrary, to dichotomize the data so that measurements less than or equal to 50 indicate disagreement with the item demonstrated in the statement, and, respectively, measurements over 50 indicate agreement. The amount of possible agreement or disagreement could not be taken into consideration anymore. This decision seemed to offer the only way out of the situation.

In order to compress the generous data, several factor analyses were applied. Statements concerning current (statements 11-63) and future' s clinical skills (statements 64-77) were processed separately. Statements 11-63 were grouped to five separate groups according to the themes in order to enable the factor analyses. The rationale behind applying factor analyses was also to try to detect possible latent 'factors', which might reside within the more

obviously appearing issues presented in the form of the statements of the questionnaire. This might be called a pursuit of raising the level of abstraction.

First a correlation matrix of the statements planned to be taken into the factor analysis was conducted. Only statements with a correlation of at least 0.3 were taken into the analysis. The extraction method applied was principal axis factor, and the criterion applied was Eigenvalues greater than 1. To obtain a solution as comprehensible and easy to interpret as possible, a rotation method was applied. To maximise the total variance explained by the factors a varimax rotation model was applied. The criterion applied in terms of the communalities was 0.3. Thus, the factors with a communality of less than 0.3 were extracted and a new factor analysis conducted applying the aforementioned technique. By applying factor analyses, the data could be compressed to form several combined variables, the properties of which are presented in Appendix 8. With each factor analysis, both Kaiser-Meyer-Olkin's test (KMO) for measuring the adequacy of the samples, and Bartlett's test for sphericity were performed. Every Bartlett's tests indicated such a significance level ($p = .000$) that the factor analyses were considered relevant (Kiviniemi 2007). Factor scores were saved and transformed according to the same principles than VAS measurements. Thus the agreement and disagreement of the three sub-panels could be tested again.

After completion of the factor analyses, sum variables were formed on the basis of the new factors born as a result of the factor analyses. The new factors were named according to a summary of the variables lying behind the new factor (Appendix 8). The reliability of the new sum variables were tested by counting their Cronbach's alpha. According to a common perception, a sum variable is reliable when reliability coefficient, i.e. Cronbach's alpha, exceeds 0.7 (Kanniainen 1999).

Finally the future-oriented statements 81-107 were cross-tabulated and tested with Fisher' s exact test to find out possible differences in the perceptions of the three sub-panels in terms of the desirability and probability of each of the statements. The results of this part of the study were rigorously taken into account when outlining the scenarios of the III Delphi- round, as will be explained next.

5.3 The third Delphi round

The purpose of the III Delphi round was to obtain an answer to research questions 'What will the operational environment for future ED nurses be like?', and 'What kinds of clinical skills

will be required from ED nurses in 2020?' Methodologically the III Delphi- round utilized principles of Argument Delphi (Kuusi 2002).

5.3.1 Data collection

Preparation of the third phase consisted of assembling the Delphi- panel to execute the anticipated work, and constructing three alternative scenarios and 'mini-scenarios' by means of which the future of clinical ED nursing was to be processed by the panel.

5.3.1.1 Assembling the Delphi panel

The logic behind the construction of the matrix, according to which the Delphi- panel was to be assembled, was to define such areas of interest that have either a direct or indirect connection to and influence on clinical ED nursing. Such areas were estimated to be the prevailing reality of ED nursing, the view of the progress of acute and emergency medicine, the view of both local and central administration and economy, and the view of research and education. The sub-panel representing the last area of interest was later called the "bystanders" due to their position of being "only" indirectly involved in clinical ED nursing. The concept "bystanders" was thus added to the name of the last sub-panel. These areas of interest built up the columns of the matrix (Appendix 7).

Furthermore, the rows of the matrix were constructed of such fields of expertise that were appraised to be necessary for covering the whole field of clinical nursing care comprehensively. These fields of expertise were finally named to be clinical skill, a sub-specialized, sophisticated skill, and the specialists of changing working environment, i.e. general experts (Appendix 7).

After constructing the matrix (Appendix 7), it was filled with names of experts to be called to participate. It was outlined that no fewer than three and no more than five panellists should be named for each cell (A – L) of the matrix. However, this turned out to be impossible as the number of panellists would have become too great to handle, and this requirement had to be compromised. The drawback of this procedure was the obviously increased risk of the participants becoming identified. This had to be taken into account especially when reporting the results in order to protect the anonymity of the participants. Therefore, in the chapter 'Results', the authentic comments of the respondents are not accompanied with any description of the person whose comment is presented.

The researcher contacted all the persons by telephone to request their willingness to participate, and everyone gave their acceptance. The participants were also asked if they would prefer to receive a paper or an electronic version of the questionnaire to be sent. Only two participants preferred an electronic version, and they were each sent one. Several participants explained that their e-mail box is most of the time so impacted that it is uncertain whether an electronic inquiry would ever reach them.

5.3.1.2 Constructing the questionnaire

The results of the II Delphi- round' s statements assessing the perceptions of the three sub-panels, and especially the generous argumentation obtained of the importance of issues to be taken into account also in the latter parts of the study, influenced directly the preparation of the III Delphi- round. After each statement the researcher compiled a simple list of arguments in favour of and against the realisation of the statement concerned. Very long lists of single words and short expressions were thus assembled. These, in turn, might have been useful to be attached to the questionnaire of the III Delphi- round for the panellists to have possibility to scrutinize all the original expressions. This was not, however, done mainly due to fear of overstraining the panellists with excessive amounts of material. Completing the questionnaire itself turned out to be quite a burden. After all, the argumentation had remarkable impact on the III Delphi- round' s form.

The questionnaire was constructed to contain four parts (A – D), as follows. A) An introduction, where the purpose and aims of the study were explained. B) The actual questionnaire, first containing three alternative future scenarios dealing with the possible changes in the working environments and operational policies of ED work in the long range future, approximately in the year 2020. The descriptions of the aforementioned issues concerning the possible futures were prepared on the basis of the results obtained during the second phase of the study, and the background information was provided for the participants along with the questionnaire. As explained previously the results of the II Delphi- round, especially in terms of the operational environment of future ED nurses, were taken into account when constructing the scenarios.

In the short instruction to part B, the respondents were asked to comment on the scenarios in the form of answering the questions: What is the most probable scenario, and on what grounds? What is the most desirable scenario, and on what grounds? Does the panellist wish to eliminate something from, or add something to the scenario chosen. If yes, what would it

be. The scenarios were entitled as follows: A) 'Business as usual'; B) 'ED nurses' profession is evolving'; and C) 'The system is in danger of collapsing'.

The scenarios were constructed around nine variables, which were included in each of the three scenarios. The manifestation and essence of the nine variables were, in turn, changed according to the assumed state of affairs in each scenario. The variables were as follows: 1) The degree of centralisation of emergency health care services; 2) The overcrowding situations in the EDs; 3) The training and education of nurses working in the EDs; 4) The independence of the nursing profession within the EDs; 5) Availability of nursing personnel; 6) Operational policies and models of action in the EDs; 7) The role of MDs in the EDs; 8) ED patient material; and 9) The state of patient satisfaction. A summary of the nine variables and the way they were presented in each scenario is provided in Appendix 9. The variables were derived, in addition to what was mentioned on previous page, from the issues affecting on background of the study and presented first in chapter 3.

Scenario I 'Business as usual' was constructed to describe a future much like the prevailing situation, as the name of the scenario also indicates. No special educational program for ED nursing has been implemented, but triage nurse' s role has been officially acknowledged. Dissatisfaction among patients has increased, and overcrowding situations come about. Nevertheless, the situation is mainly under control

According to **Scenario II 'ED nurse' s occupational profile is evolving'** the future appears in a positive light. The heavy centralisation of emergency health care services has turned out to be beneficial. The structural and operational reforms implemented have yielded a more fluent and less congested reality to prevail in the EDs, which have become magnet units with remarkable reduction of the turnover of the nursing personnel. The educational level as well as the independence of ED nurses' profession has increased. These reforms have, together with other reforms, resulted in the ability of EDs to respond to patients' needs in a satisfactory way. Complaints are received more seldom even though patient material has become more demanding. This scenario intentionally overestimates the overflowing importance of ED nurses' role in terms of the positive state of affairs described.

An extremely heavy centralisation on emergency health care services are described in the **III scenario named 'The system is in danger of collapsing'**. The EDs left are struggling with continuously worsening problems, and a survival game might better describe the reality of

this ‘horror’ scenario. This scenario intentionally presents a future, where everything that can go wrong, also has done so. Both the amount and educational level of nursing personnel in the EDs are grossly insufficient, and the medical profession is suffering from he same problems. Patient satisfaction has collapsed severely, and malpractice complaints are received continuously.

The descriptions of the scenarios were intentionally very pointed in order to stimulate argumentation, but this was, by a few panellists, regarded as over-emphasising the role of an ED nurse in the future health care. Admittedly, this was to some extent the case, and a more comprehensive introduction to the purpose of this part of the study and the meaning of the scenarios might have been useful. On the other hand, the questionnaire itself was already lengthy and unarguably a significant burden of work, especially as some of the panellists had already taken part in both previous phases of the study.

Part B of the questionnaire also included statements or ‘mini-scenarios’ concerning future operational policies of ED nurses’ work. The construction of the “mini-scenarios” was based mainly on the results of the II Delphi- round, as well. However, these results are not reported separately in this research report, as they were intended to impact indirectly on the final results of the study, which also realized. All those statements the mean importance of which was estimated by the respondents to be over 50 of 100 during the II Delphi- round were counted in this phase of the study. These statements were based on the responses to the second phase of the study and a report of The Ministry of Social Affairs and Health (Hukkanen and Vallimies-Patomäki 2005) dealing with co-operation and division of work in securing access to care. The respondents were asked to choose either alternative in terms of both the probability and desirability of each statement of the ‘mini-scenarios’. Comments for justification of the respondents’ choices were asked along with each statement.

In part C of the questionnaire, the respondents were provided with background information concerning knowledge of the future of health care in order to facilitate the orientation to futures thinking of the respondents. The background information was gathered from one scientific article dealing with the future of European health care (Saritas and Keenan 2004), and from a report of the Committee for the Future of the Finnish Parliament ‘The Future of Finnish Health Care. Strategies and scenarios to secure health care services in Finland in the future’ (The Parliament of Finland 8/2004). These sources were selected on the grounds of

their scientific accuracy and relevance, and for their time frame being close to the one chosen for this study.

Part D provided an alphabetical list of the Delphi panellists (N = 36) accompanied with the panellists' background organisation. This was done in order to enhance the motivation of the respondents', by providing the opportunity to understand the composition of the whole panel. However, it was clearly stated that the outcomes from the panellists would be reported strictly anonymously. Finally, all the mailed questionnaires were again accompanied with a return envelope with author's address and stamp on it.

The panellists were not provided any recommendations or instructions of how to organize their work. Most probably they have all worked as individuals without contacts to other panellists. As mentioned already they were provided an alphabetical list of names of the whole panel, but no information of how the panel has been constructed or what sub-panel the panellist is representing. This was due to a wish to get the panellists to share their valuable information as unbiased as possible, and primarily from the standpoint of the individuals in question. This wish was considered appropriate regardless of the scientific underpinning that each individual was recruited to represent one of the sub-panels. The information policy issues emphasized by Kuusi (1999) had to be taken into account, again.

5.3.2 Analyses of the data

The panellists' comments on the scenarios were simply counted and tabulated as figures and percentages in terms of the probability and desirability of the scenarios A – C. Arguments in favour of and against each scenario are presented as a summary accompanied, with direct citations as well as issues desired to be removed from or added to the scenario in focus. The summaries were compiled by conducting a content analysis of the arguments.

The 'mini-scenarios' are presented as tables consisting of frequencies in terms of the assessments of the probability and desirability of the 'mini-scenarios' (Tables 7–19). The argumentation in favour of and against the probability and desirability is provided after each 'mini-scenario' as a summary, also accompanied with direct citations. The summaries are compiled in the aforementioned way.

5.4 The fourth Delphi round

Obeying the basic principles of Argument Delphi (Kuusi 1999), the IV Delphi- round aimed at obtaining the comments of four experts representing each sub-panel on the preliminary report concerning the results of the Delphi- panellists' work. The rationale behind the IV Delphi- round was the aspiration to provide panellists a genuine possibility to see and learn from other panellists' responses, claims and arguments, and thus reconsider their own assessments and their arguments. This was supposed to fulfil one precondition of every Delphi- study, namely iteration (Kuusi, O. 11.08.2008. Personal communication).

5.4.1 Data collection

The experts were solicited using purposeful sampling technique, one to represent each of the sub-panels of the III Delphi- round. The selection criteria of the final panel were previously demonstrated activity and willingness in producing relevant arguments, as well as feasibility and availability for the purposes of the study. It had to be seriously weighted that several experts of the Delphi panel had already been involved with the study during all three previous rounds, and serious scrutiny had to be executed in deciding whom to approach in order to not burden the volunteer experts excessively. All four review-panellists-to-be were contacted personally by the researcher, and all four accepted the invitation to perform the final review. Three of the four review-panellists had participated in three and one in two previous rounds, so they were familiar with the idea and execution of the study. During the interviews of the I round the three participants had demonstrated ability and willingness to produce useful information for the purposes of the study. The reviewers all had different educational and working background, so various aspects of the issues in the focus of the study were possible to get revealed. The intention was to assemble such a panel that most probably would not produce merely unanimous perceptions of the future of ED nursing. Especially productive were anticipated to be the various, even opposing, views and the arguments in favour of the views expressed. These criteria were applied when assembling the review-panel.

The results of the third Delphi- round were fed back to the review panel in such a form that they contained the original data without interpretation of the researcher. The textual data were summarised, and quotations from original expressions were attached generously to enhance authenticity and trustworthiness of the material. The comments and arguments of the third Delphi- round' s panellists concerning each of the four scenarios had been classified and presented according to the results of the panellists' procession: A) Centralisation of

emergency health care services; B) Nurses' education; C) Nurses' increased responsibilities; and D) Miscellaneous. Once again, these are the themes that have previously been stated (Chapter 3) to exist on background of the study having effect on the research phenomenom. As an attempt to pursue maximal clearness the results were presented according to the four sub-panels. Frequency distributions concerning the probability and desirability of the futures scenarios as well as the 13 statements concerning the future of designated clinical tasks were counted and presented according to the four sub-panels for the same reason.

The scientific endeavour was to maintain the role and influence of the researcher on the data as minimal as possible and to provide the review panellists the results of the III Delphi- round as clearly as possible. Especial meticulousness was executed when reading and summarising the textual data. Particularly such comments and arguments that appeared to be conflicting with some other sub-panellist' s comments were carefully selected for the IV round. More or less incipient conflicts, or at least tension, could be detected, but they seemed to be more in connection with particular individuals than the sub-panel the individual was representing. However, these signs of possible conflicting interests were searched with rigour.

The review-panellists were guided to pay special attention to the results in terms of the credibility, reliability, possible surprising and unexpected as well as not surprising and expected findings. They were asked to comment on findings they would clearly agree or disagree with, and findings they would like to change or remove. Argumentation in favour of the comments was indicated to be desirable. Approximately two weeks working time was decided to be appropriate.

Electronic versions of the results were mailed to three review-panellists, while one of them requested and subsequently received a paper version. The responses were asked to be sent in such a form that causes least burden for the respondents. Two electronic and one paper versions were received with generous comments, as had been the original purpose. Due to one review-panellist' s severe time-constraints the comments were obtained via telephone, and the researcher made notes sufficiently that the panellist's comments could be fully utilised. The review-panellists had mainly commented on the results of their own sub-panel, but a few comments concerning other results were obtained in addition.

5.4.2 Analysis of the data

After multiple in-depth readings of the data produced during the IV Delphi- round a content analysis was performed, and especially the arguments were an object of special interest. Due to the small size of the review panel, and to protect the anonymity of the panellists, the data were processed and presented mainly as one mutual output of the whole panel. Original citations are provided in order to elucidate the way the final panel had perceived the results of the III Delphi round.

5.5 Ethical considerations

This study aims at acting in concordance with the current obligations of Finnish universities, i.e. working in collaboration with the surrounding society, and mindfulness of the effectiveness of the results of the research. Furthermore, with reference to Niiniluoto and Sihvola (2005), the aim is to perform an analysis of the background to the issues in the focus of this research, and thus provide citizens with material and grounds for independent intellectual processing.

The author is a registered nurse and a member of Finnish Nurses Association, which ties him inseparably to both domestic and international Ethical Guidelines of Nursing (Finnish Nurses Association 1996). The study has been conducted at Kuopio University, so the researcher has obeyed the Ethical Guidelines of the Faculty of Social Sciences of the University (Kuopio University 2002).

Each organisation involved with either the pilot or actual study processed the author's appeal for permission to conduct the study using the institutes' personnel as subjects according to the research policy of the institute in question. All permissions were given. It was stressed that all participation was voluntary, and that all the information obtained would be handled confidentially and anonymously. During the second phase of the study the author had personally delivered the questionnaires to each ED as agreed with the management of each organisation. The questionnaires were left at a place where everyone could pick up and leave a questionnaire so that participation was left to be an individual decision of each ED nurse. All the data gathered was stored and handled according to the regulations of current legislation (Personal Data Act 523 / 1999).

The ethics of the study has been pursued by operating as cost-effectively as possible. Since Delphi- studies unarguably are time-consuming, the method is claimed to be expensive

(Hyttinen and Aavarinne 2000). It follows that the researcher is obliged to act according to the principle of minimising the harm caused. It is translated here as conducting only such a number amount of Delphi- rounds as is necessary in proportion to the aims of the study. However, the participants have undoubtedly been exposed to a heavy burden, especially those participating in three or even all four rounds of the study. Still, the principle of beneficence has been respected, and the participants have been protected from exploitation.

After all the years spent with the study the subject still seems valid, relevant and worth the effort invested in it. Yet, the continuously worsening availability of qualified nursing personnel for ED nursing purposes may have resulted in an accelerated pace of work. This fear has not so infrequently sneaked to the researcher' s mind provoking him to wonder whether it is unethical to even consider for example expanded scope of ED nurses' practice. Furthermore, the second research question deals with the issue of the level of ED nurses' clinical skills currently. To be precise it actually deals with respondents' perceptions of this issue, which is not necessarily exactly the same as the prevailing state of affairs. This might have caused concern among both ED nurses themselves and the respondents, but messages referring to this direction have not been received by the researcher.

The method chosen, Delphi- technique with features of Argument Delphi, has turned out to be relevant. Still, a strict adherence to all the requirements of Argument Delphi (Kuusi 1999) turned out to be impossible, even though this was the researcher's very first idea, which eventually had to be compromised. Whether the purposes of the study would have been achieved utilising some other less researcher' s as well as respondents' time- and effort-consuming method of scientific inquiry, remains unknown, but deserves to be scrutinized when future research is planned.

Several aspects have had to be taken into consideration for safeguarding participants' identities. This aim has yielded to minimize the information provided of the respondents' in the research report, though quotations from respondents' speech and written arguments are offered generously.

The researcher has pursued at obtaining and maintaining competence both in the subject matter and methodologies to protect the valuable data from being violated. Experts in both qualitative and quantitative data analysis have been consulted frequently. However, especially

with analysis of the qualitative data the inexperience of the researcher may have shown as slowdown of the research process.

The decision to publish the research report in English has caused some concerns. Translating the speech of the interviewees from Finnish to English may have violated some basic principles of qualitative study, but the original expressions have been reached for as far as has been possible for the researcher. This procedure, however, can be questioned.

6 Results

When appropriate the results are presented obeying the idea of Argument Delphi- technique, i.e. according to each sub-panel. The processing will follow the appearance of the research questions: First the requirements of clinical skills of ED nurses currently, secondly on what level are the clinical skills of ED nurses currently, thirdly the operational environments of futures ED nurses, and fourthly what kind of clinical sills will be required from ED nurses in 2020. It seems reasonable to point out that the data produced from the interviews included generous material that is omitted from this report. The data set aside for the present will be submitted for the evaluation of the scientific community later.

6.1 The clinical skills currently required from ED nurses

Three areas of clinical skills required from ED nurses currently were revealed: **Basic skills of a nurse**; **Basic skills of an ED nurse**; and **Advanced skills of an ED nurse**. These items are presented in corresponding order. It seems appropriate to point out that all these three areas are needed to compose an ED nurse with adequate skills.

6.1.1 Basic skills of a nurse

These are skills every qualified RN should master, and they serve as the foundation on which the professional development of the nurse is built. This item consisted of five issues, which were named 'Core nursing skills', 'Ability to master practical nursing ethics', 'Human relations skills', 'Ability to situational awareness', and 'Ability to tolerate change' (Figure 8).

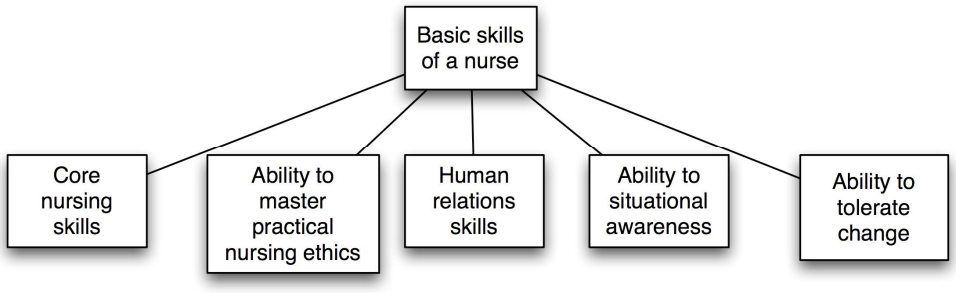

FIGURE 8. Basic skills of a nurse.

Core nursing skills
Manual psycho-motor skills, mastery of equipment and procedures, and skills required when assisting a MD were dealt with in this occasion. As the name of this issue refers, it deals with

the very core nature of what it is to be being a nurse and to implement nursing in day-to-day life. A wide variety of issues were specified, and the approach turned out to be predominantly technical. The very core of nursing was considered to be tightly connected with taking care of medication, mastery of procedures, since all intravenously administered drugs and fluids are a nurse's domain, together with supporting the vital functions, when necessary: *"You must master the pharmacotherapy and procedures." "Setting i.v.-lines and implementing intravenous fluid therapy, and implementing pharmacotherapy." "We must be able to treat severely injured patients fluently." "Bag-valve-mask ventilation and intravenous medication are ED nurses' duties."*

Skills, and especially manual, psycho-motor skills, were highly valued. They were connected to clinical nursing situations, and more emphasis was also wished to be placed put on the development of psycho-motor skills during the education of nurses, and during in-service training as well. It was considered as an obligation to acquire these necessary skills, as the lack or inadequacy of them was perceived to be harmful for patients, and could not be replaced by anyone else's input to the work: *"You must have extremely good manual skills." "They should be extensively skilled and competent." "Certain kind of competence is required, as there are certain things the implementation of which should not be delayed in some situations more than a few tens of seconds. So, then these people, anyone of them, would be able to do what is needed." "A remarkable amount of attention should be paid to clinical skills."*

A sovereign, or at least fluent mastery of the technical devices and equipment needed in care was regarded as a matter of patient safety and characteristic to ED nursing. In a clinical situation there does not exist time for trying to learn the appropriate and safe use of the necessary equipment and devices, and some of them were considered to be of vital importance in the care of critically ill and injured patients. An insufficient mastery of technical skills was pointed out by several respondents in terms of newly recruited nurses, and some teachers also expressed their concern. On the other hand, the younger nurses were claimed to be more active and competent in technical skills than the more experienced ones, unless some very infrequently needed devices were dealt with: *"An absolute necessity is the mastery of technical devices and equipment." "The use of medical equipment such as defibrillators, infusion pumps, they have to be mastered."*

In addition to the requirement of mastering the procedures performed by nurses, it was mentioned necessary to master the assisting of MDs in procedures performed by them. It seems appropriate to point out that assisting an MD was not considered to be a passive function of a nurse. On the contrary, it was rather considered a matter of honour, or at least part of a nurses' professionalism, to be sufficiently skilled assistants that the circumstances for MDs to perform procedures are as favourable as possible. This, furthermore, was necessary in order to save the MDs valuable time, as well as to protect patients against unnecessary delays and even pain. This did not, however, turn out to be a major issue, but the data indicate that these skills should not be taken for granted, either. Some of the procedures were reported to be infrequently needed, and the more experienced nurses appeared to be more familiar with them: *"You have to be able to assist an MD in performing procedures."*

The role of an observer did not arise very clearly from the data. Only a few mentions were noticed, and they were connected to monitoring the vital functions of critically ill and injured patients: *"There are lots of observation of the vital functions belonging to us."*

Ability to master practical nursing ethics

Moral and value- related issues appeared here. Morality was described by expressions connected with willingness to help patients and their relatives. Acting professionally with patients, while simultaneously being in the situation as a human being was considered desirable. A clear concern of these issues was expressed, and a soft side of nursing was brought under discussion. Such a perception was formed that a deep respect towards the distress of patients and their relatives was built into the respondents. Abilities to relieve that distress were highly appreciated, which was expressed frequently; *"…that you are able to face an acutely ill patient, and in addition to that, also the relatives." "In order to be able to help patients and their relatives." "Humanity and humane skills in general."*

Values and their realisation in real-life were raised to be a concern, not widely, but clearly. Values were not mentioned as separate concepts, but closely connected with action: *"It is required that there be a perception of values and their realisation in practice. Ethicality should show."*

Human relations skills

Skills to organise, to create a caring relationship without delay, and to act as a team-leader as well as to act as a member of a multi-professional team were emphasized. It was clearly demonstrated that an ED nurse needs such skills that enable a human approach to patient

situations. The contact and caring relationship should be established quickly due to the nature of ED work. Organising skills and preparedness to act as a member in a multi-professional team were highly valued.

Nursing was regarded as serving clients, and skills related to creating a caring relationship in the often hasty circumstances of an ED were emphasised. The caring relationship should often be established simultaneously with patient assessment and while care is continuing. This sets its own demands to the human relations skills when handling people, and in giving the impression of calmness and having things under control. Due to the multi-professional nature of the work, the role of an ED nurse is both the role of a team-leader and a role of one to be led. This, in turn, was believed to set special requirements for the knowledge of human behaviour: *"How the caring relationship is created, while the action is going all the time." "You should possess good skills in handling with people." "A real professionalism can be noticed also as client service skills." "Communication skills are in continuous use." "You must have knowledge of human reactions here." "The importance of the social side of this work should not be underestimated."*

As patients are discharged from ED they should receive guidance, and that also seems to often take place in haste. Interest in patients' holistic approach and their managing of their health problems should be expressed. As the population ages, the importance and quantity of these tasks seems to be growing and becoming more demanding. While an ED nurse should have the time, patience and skills to guide an elderly patient ready to be discharged, all the rush and congestion continues. Demanding prioritisation questions were revealed: *"You should have a holistic view of your patients and their life span." "There ought to be time for patient teaching and guidance." "...and then we should see the big picture, in other words that we are, within nursing, interested in how those human beings are managing with their diseases." "This work is more than examining patients, too." "Discharging older patients is demanding."*

Ability to situational awareness

Skills to master changing incidents and control the prevailing situation in the ED appeared. Under this issue, an expression of 'Situational mastery' was detected. It turned out to be close to the very nature of something called 'A good, skilled ED nurse'. Furthermore, it was expressed that some just seem to have this skill, and others do not. Mastery of suddenly changing situations is in close connection to ability to prioritise, but it also means ability to

face difficult situations with patients, relatives, own staff, and others: *"Being able to face all the situations that come across."*

Ability to tolerate change

It was repeatedly mentioned that 'nothing is as sustainable as the continuing change', and the requirements caused by this fact emerged here. The changing age-class distribution is bringing along new and growing challenges, and the unavoidable ageing of the population will set more requirements for taking these predictions into account. A clear message was that all kinds of requirements have increased constantly. Nurses with a long working history were able to compare current and previous requirements, and expressed the change as follows: *"In a way you have to master a lot more than in the old days." "The age-distribution has brought along this change." "The demands have grown all the time*."

6.1.2 Basic skills of an ED nurse

Such issues emerged here that can be regarded as especially typical requirements for an ED nurse. Four definite issues were revealed under this item, as shown in Figure 9.

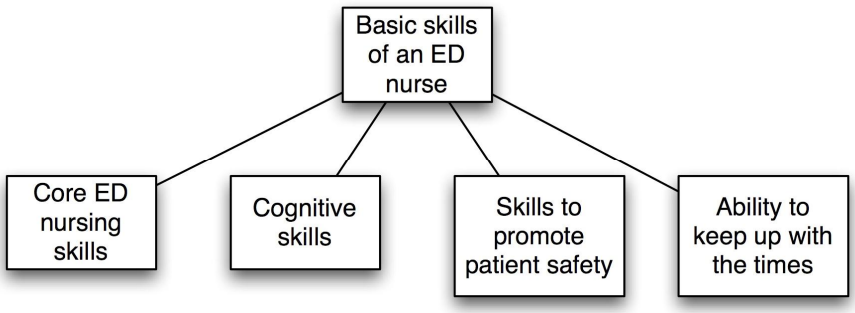

FIGURE 9. Basic skills of an ED nurse.

Core ED nursing skills

These were skills to work in partnership with MDs and as a logistics manager, individual expertise in emergency nursing and general expertise with a wide variety as well as skills to ascertain uninterrupted transfer of patient data. This appeared to be a two-part issue. It was considered important that the ED nurse works in tight collaboration with MDs, especially when the care of critically ill and injured patients is in question. The implementation of trauma-teams to the initial care of high-risk trauma patients had influenced some respondents'

thinking, and one of the roles of an ED nurse was considered to be a 'partnership' role with the trauma-leader. All in all, a logistics manager is continuously needed, and this seemed to be a natural role for ED nurses. Someone is needed who thoroughly knows the protocols as well as unwritten agreements of the hospital in order to facilitate fluent activity.

On the other hand, individual expertise in terms of acute care and a wide variety of general expertise were considered to be essential parts of an ED nurse's role. Capability to act according to one's own assessment and to draw conclusions independently was also connected to the role: *"A certain logistics manager is always needed." "This trauma leader absolutely needs a partner." "You should be ready to take orders and put them to action almost any time." "You ought to be an expert in acute care, and also a general expert, from whom everyone expects to get the right answers immediately. "*

Booking and ascertaining uninterrupted transfer of patient data was considered to be one of the core elements in ED nursing. All aspects of acute care and first aid should be mastered, as well as the comprehensive management of the situation in the ED. Someone has to keep the situation under control, and this seems to be conceived as an ED nurse' s role. It was mentioned several times that in addition to the requirement of mastering the initial care of patients representing several medical specialisms and sub-specialisms, some aspects of intensive care should also be mastered. Examples of this were e.g. patients needing a ventilator, invasive monitoring, and vasoactive drugs: *"You have to master the care during the initial phase." "First aid in various situations for different kinds of patients, from babies to grandfathers, must be mastered." "You must have preparedness for caring for patient needing intensive care including the post-resuscitation phase, when the patient needs a ventilator and all those lines and tubes and pumps." "Booking all initial observations, and utilising that data when observing the patient continuously in order to be able to make interventions should the patient's clinical state change." "You must bear in mind the idea that what is the state of all the other patients, which are there in the ED at the same time." "And you should, of course, implement ED nursing according to your own conclusions, and partially according to the orders of an MD." "The mastery of these urgent critical situations, recognition of the failing of vital functions..."*

Cognitive skills

The perceptions of the cognitive requirements demanded of an ED nurse can be summarised into two fields. First, a wide knowledge of natural and nursing sciences should be possessed in order to understand, how the human body and mind normally function. Secondly, a thorough knowledge and understanding of pathophysiologic mechanisms enables understanding of why and how the human body functions when it has ceased being healthy.

Knowledge from different medical specialisms is required, and the knowledge should be quite comprehensive. The importance of the natural sciences was emphasised, and the knowledge base of nursing science was also considered relevant and important. However, the importance of the natural sciences was clearly stressed. Comprehension of pathophysiology enables the possession of a background and a deeper meaning for examining and observing patients and their signs and symptoms. Without knowledge there can hardly be understanding, and without understanding all the theory has to be learned by heart. Such an operational model is vulnerable, and not very effective in clinical situations: *"…such knowledge that enables reaching diagnosis for patients." "You should understand, why something is like it is, and what leads to where." "For understanding, what you are doing and why." "Our area is extremely large, all the specialisms should be mastered to some extent." "It would be extremely important to know and master the theoretical background for these things." "The knowledge base and practical competence." "Anatomy and physiology should be emphasised."*

Possession of an adequate knowledge base and being able to apply it in clinical situations were considered prerequisites for ED nursing. An emphasis was placed on the skills, so that knowledge alone did not seem to make an ED nurse. The combination of knowledge and an ability to apply knowledge was a basic element of what was called clinical skill: *"For you to be able to make decisions based on the theoretical knowledge and experience-based knowledge." "A wide theoretical knowledge base applied to ED nursing."*

Skills to promote patient safety

Skills that enable the comprehension of the whole chain of survival were obviously appreciated. The issue of safety was highlighted, and it appeared to be the continuum of the care that caused concern. The whole chain of survival ought to be comprehended in order to enhance patients' safety. If the whole continuum of the care is not known and comprehended, it is possible that information with clinical relevance is lost when patients are being

transferred from ambulances to ED, and from ED to continuing care. This poses a threat to patient safety:

"There should exist some kind of understanding of the continuum of the care." "They should understand a little about what happens there outside the hospital." "The role and functions of the other stakeholders ought to be understood." "The sources that feed us patients, and the patient receiving ones, ought to be known."

Ability to keep up with the times

Being an active person appeared to be related to clinical skills, albeit indirectly. Characteristics like being interested in everything that happens in the world around us were valued, and were interpreted as being features of an active person. In addition to preferring an active colleague to a more passive one, this phenomenon was, albeit indirectly, connected to clinical nursing: *"You ought to be interested in everything that changes in the world." "Above all, you should live in a close connection with the time around you."*

6.1.3 Advanced skills of an ED nurse

This item seemed to be consisted of four (Figure 10) issues with close resemblance. The differences, albeit admittedly minimal-sounding, bear remarkable importance, and therefore should be neither misunderstood nor undervalued.

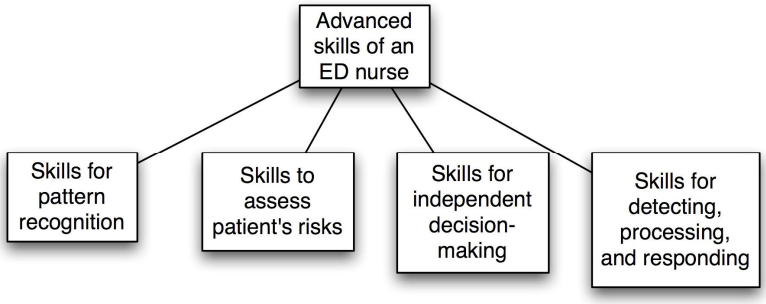

FIGURE 10. Essence of 'Advanced skills of an ED nurse'.

Skills for pattern recognition

A skill having paramount importance in the clinical ED nursing seemed to be the ability to recognize the pattern of a seriously ill or injured patient with one glance. This was acknowledged to be characteristic for an experienced ED nurse. In order to be able to make reliable assessments of patients' clinical condition, the ability to make a distinction between

anatomically and physiologically normal and abnormal findings was considered to be a requirement. Furthermore, to be able to discern what is abnormal and what is critically abnormal was regarded as more difficult, and a prerequisite for being able to react in an appropriate way to the situation in question. An illustrative example of the expressions used was: *"To understand, what is normal, what is abnormal, and what is critically abnormal."*

The concept of recognition was related to the ED nurse's ability to detect symptoms and phenomena that possibly, or obviously, are signs of impending threat to the patient's life, or at least well-being. The material related to recognition was generous, and such descriptions were used as follows: *"To find the things that put the patient in a risk." "Immediately life-threatening conditions would become ruled out." "You should have a good clinical eye." "You should quickly see if the patient is in need of immediate care." "Recognition of clinical conditions." "Recognition of alterations caused by sickness." "Ability to integrate separate observations."*

A strong emphasis, especially among the more experienced nurses and most MDs, was placed on the ED nurse's ability to make reliable patient assessment without any technical devices, i.e. through seeing, hearing, touching and listening. A concern was raised that along with the emergence of more and more sophisticated technical devices the clinical assessment skills are becoming rusty. Furthermore, what might be even more remarkable, the traditional clinical assessment skills are perhaps not any longer appreciated, mastered and trusted among the younger generation of health care practitioners. Justification for these worries were based on such comments as: *"The bed-side methods should be emphasised more." "Taking a patient' s pulse just does not happen anymore." "We should assess the temperature of peripheric body parts more often." "They assess the patient's breathing, frequency of respiration, they don't, however, listen to the lung sounds, which should, at least with trauma patients, be an essential part of patient's examination made by a nurses."*

One of the most characteristic features of the requirements set to ED nurses' clinical skills turned out to be the ability to anticipate the clinical course of patients, as well as the proceeding of certain situations. It was described as an ability to somehow sense the next phase of a patients' clinical state. For some reason the ability to foresee was more strongly related to anticipation of the clinical course of trauma patients than others: *"In certain situations you should be able to foresee." "It is a matter of being able to utilise the*

knowledge of trauma mechanisms with the assessment, and to foresee possibly impending problems."

Skills to assess patient's risks

The assessment skills, including ability to make a systematic patient assessment as well as to prioritize both individual patients and tasks, will be discussed here. These were almost unanimously regarded as core assets of ED nurses' repertoire of attributes. This became evident in many ways, along with the proceeding of the analysis of the data. Thus, several examples of the responses are provided: *"They should be able to make an immediate primary survey." "On a certain level you should be able to examine the patient clinically." "They should be able to assess the risk of the patient." "You must have the ability to interview and take an anamnesis." "Every patient would be examined before they find their way to the MD." "So there would be a triage nurse or somebody, who would go through all the patients." "They should be able to assess the urgency and seriousness of the patient s situation."*

In particular, many emergency MDs seemed to regard bringing more systematics into the daily work in EDs as necessary. Systematic assessment was also considered to be a cornerstone, when aiming at enhancing the safety level of ED care. On the other hand, providing systematic assessment appeared to be one way of obeying the principle of equal care to all patients, which was expressed clearly by the respondents: *"All groups of patients would be provided with a kind of structured system." "We should establish a system of equal treatment for certain groups of patients." "Ability to make a systematic assessment is a keystone skill of these nurses." "We already have a system, according to which the patient' s vital functions – breathing, circulation, the level of consciousness, and also the status of psyche – are always assessed."*

The existence of some kind of system which enables incoming patients' classification according to their urgency and medical speciality was regarded as a prerequisite for running an ED successfully. The selection of patients to either primary health care or specialised medical care was considered to be a primary duty and responsibility of ED nurses. Also, the initiation of immediate measures needed to save a critically ill or injured patient was considered to be the responsibility of the triaging nurse. The importance of mastering the skills required for making a reliable triage was described as follows: *"You should be confident in making triage so that you can put the patient to specialised medical care, or even to the*

resuscitation room, if it looks like that." "It would be like a fast triage." "You ought to have the triage system in your head."

The ability to prioritise seems to be close to the ability to make triage. However, prioritisation concerns both tasks and patients, and thus differs from prioritisation merely of patients and their urgency. In the everyday life of EDs there seems to be a tendency towards congestion of things to be done, and, at its worst, even the most important things have to be prioritised. The ability to differentiate between important and even more important things to be done, seems to be an essential requirement set to an ED nurse: *"You must have the eye to tell apart a sick and less sick patient, and to make a prioritisation." "You must be able to tell apart what is significant and what is not. "You have to able to prioritise both tasks and patients."*

Skills for independent decision-making

Ability and willingness to act in an independent manner was emphasized by ED nurses, and is the following subject taken under surveillance. This attribute might be regarded as the next step following the aforementioned skills to assess patient' s risks. When the risks are assessed, a decision is required with regard to what the next step should be. The requirement of independence was connected both to ability for independent decision-making, and a more indistinct or blurred concept describing some ED nurses' way of approaching their work. This concept seems to be hard to define accurately. However, it was clearly expressed as being a positive attribute, and consisting of attitude, willingness and ability to take responsibility for patients without immediately seeking someone else's permission to, for example, conducting a thorough examination and drawing conclusions. Anyway, this was expressed as not being the same as exceeding one's authority: *"They should want to examine the patient independently." "An independent approach to work." "What is needed is ability to independent decision- making." "Ability and willingness to face a patient." "There, by the entrance, the right kind of attitude is required."*

Decision-making seemed to be connected with making observations and drawing the right conclusions, which should be transferred to appropriate action according to the needs of patients: *"From the patients' situation you should be able to draw certain conclusions." "There should be ability to medical decision-making and problem solving." "All kinds of decision-making related to practical action, and such action that is required in a situation, when the patient is in the ED."*

There appeared to be concern about the perceptions of the role and duties of an ED nurse. This was expressed in a way that connects the item closely to the clinical reality of the respondents: *"The nurses don't necessarily conceive for example defibrillation of patient's ventricular fibrillation as a duty naturally belonging to them." "There still prevails an attitude that it does not belong to the domain of nursing and nurses."*

Skills for detecting, processing, and responding

A very narrow gap separates this set of skills from the previously mentioned two issues. With the risk of splitting hairs the researcher claims the data to indicate that a skill to detect, process, and respond comprises an entity of its own. In a way this combination might be considered a special and definitely an advanced skill with the aforementioned components so tightly combined that they can' t be separated in the clinical reality. Presumably the decisive factor for this elusive set of skills is the fact that they occur virtually almost simultaneously.

Comprehension can be explained here as a deep understanding of what has been discovered or observed, knowing the clinical relevance and importance of it, and being aware of the actions needed to be taken. Some concern was raised with regard to all these components, and it was described as follows: *"Writing down your observations is not enough, you must also utilise the data." "Utilising what has been observed does not necessarily always happen, even if the information could be found from the patient's files."*

Reacting quickly, when this is in a patient's best interest, was commonly considered a fundamental requirement of an ED nurse. In addition to reacting quickly, the response should be spontaneous and appropriate. It was also considered that the training of ED nurses should be on such a level that this comes about when needed. This phenomenon was described as: *"Such a preparedness should be with us all." "A rapid, adequate response to appropriate situations – that is needed." "You must act extremely fast."*

It was commonly regarded as desirable that an ED nurse would be officially delegated the right to initiate certain treatments in pre-defined situations. Starting the action, when a patient, requiring immediate attention, comes or is brought to the ED, was also considered as a major responsibility of and ED nurse: *"It would be useful that we could initiate certain treatments there immediately." "Even to start establishing the care in a way"*

In order to be able to initiate the necessary treatment you should be able to make useful observations, process them in an appropriate way, and also have the necessary confidence and

skills for not hesitating at the initial phase of the care: *"To do things, and to get things going based on the information obtained about the patient." "They should start acting according to their observations, when necessary." "The patient's situation should awake some kinds of reactions."*

Both the ability to perform procedures independently, and assessing the need for them, was pointed out. In particular the skills needed in urgent situations were considered to be necessary to master without anyone's help or assistance, and with an active approach to work: *"Certain procedures must be mastered independently." "They should be able to use technical examination devices independently."*

It was frequently expressed that ED nurses should possess the skills for recognising the need for certain treatments, as well as to implement those at least life-saving measures, if needed. Furthermore, even if a patient is recognised to need such a care that can only be performed by an MD, ED nurses ought to be able to initiate the first measures towards the care performed by an MD: *"Taking care of pain medication and oxygen therapy, starting CPAP- care, all kinds of things like this could be started by us at the same time." "Initiation of the care and all the help the patient needs should be done by us."*

The role of ED nurses was clearly wished to be active so that they would be willing to and capable for turning their knowledge into action in proportion to the needs of patients. It was widely acknowledged that ED nurses possess a high degree of theoretical knowledge, but this does not necessarily translate into appropriate action. The perception of the role of ED nurses as active performers was emphasised here: *"Utilising the information gathered with monitoring equipment and other devices, and processing it so that it is turned into action – this is what they ought to be able to do."*

On the other hand, from the generous data a few mentions towards such a situation that clinical skills are not actually required so much, was observed. The justification for these comments appeared to be such that the role of an ED nurse is a passive one; they expect the MD on-call to give instructions concerning how things have to be done. Despite the low frequency, these seemed to be weighty perceptions: *"I don't believe that clinical skills are currently very much required from them."*

6.1.4 Summary: 'Skills for wise risk management'

The analysis of the aforementioned items, representing three areas of clinical skills required from ED nurses currently, was further continued. The first two areas were combined to form a combination of clinical skills that enable to manage issues that are at hand at any given moment (Figure 11). Furthermore, skills to anticipate impending situations and events were derived from Advanced skills of an ED nurse, and were clearly considered attributes of an experienced ED nurse. Finally, Figure 11 summarises the ultimate answer to research question I: What kinds of clinical skills are currently required from an ED nurse?

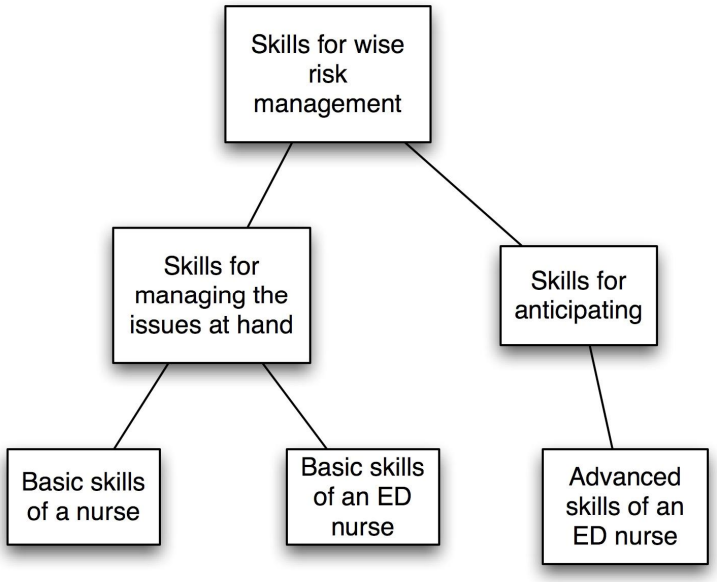

FIGURE 11. The clinical skills required from ED nurses currently.

The entity of clinical skills required from ED nurses currently comprises three components: the basic skills of a nurse, basic skills of an ED nurse, and advanced skills of an ED nurse. The first and the second component enable the ED nurse, especially a less experienced one, to manage such situations that are at hand at any given moment of time. An ED nurse having the competence of this level may not necessarily, however, be capable of mastering large entities, and especially not able to anticipate how things are going to proceed. The clinical course of individual patients may possibly be anticipated to some extent, but the level of experience and tacit knowledge does not allow more far-reaching anticipations.

An ED nurse possessing qualifications of the third component can, in addition to what has been previously described, to some extent also anticipate how the situation in the ED seems to be proceeding. This attribute, in turn, permits being prepared for sudden changes both in individual patients' clinical course as well as ED's overall situation. Here this attribute is called skills for wise risk management.

As explained in chapter 5.1 the mind map constructed from the previous outcome of the analysing process to serve as the basis for assembling the questionnaire for the II Delphi round is attached as Appendix 6.

6.2 The level of ED nurses' clinical skills currently

The perceptions of the three Delphi- panels representing ED nurses, nursing managers and MDs are presented according to combined variables (Appendix 8), which represent different dimensions of clinical skills. The combined variables, in turn, are grouped according to themes equal to the classification of the literature survey with such an addition that *Clinical judgement* has been included in the four themes for reasons of expediency. The themes were as follows: ED triage; Caring and nursing role of an ED nurse; Expanding the scope of an ED nurse's practice; and, Clinical competence and competence assessment.

Theme: ED triage

Quality of the skill to challenge the assessment made by the triage nurse

Nursing managers demonstrated a more positive stance towards this skill than ED nurses and MDs. The difference did not, however, reach the level of statistical significance ($p = 0.224$).

Quality of the assessment skills

Here the sub-panel of MDs appeared to be in clear contradiction with the other sub-panels, as the MDs did not consider triage nurses' assessments to be mainly correct. Neither did they believe that an ED nurse is capable of making reliable clinical patient assessment without equipment. MDs' estimations turned out to be significantly lower ($p = 0.007$) than the other two sub-panels'.

Theme: Caring and nursing role of an ED nurse

Quality of caring for the basic needs

An unanimous perception seemed to be that an ED nurse masters the skills in the very core of nursing.

Quality of the skills for pain management

Skills in pain management, despite the fact that pain is recognised, were considered inadequate by both the MDs and nursing managers. The differences were statistically significant ($p = 0.003$).

The quality of the skills to co-operate with the EMS system

MDs' sub-panel turned out to be least critical towards these skills, but statistically significance could not be demonstrated, though ($p = 0.124$).

The quality of skills to co-operate with other public authorities

Here, in turn, MDs had more critical perceptions than ED nurses and nursing managers, albeit statistically significant difference could not be found ($p = 0.079$).

Theme: Expanding the scope of an ED nurse' s practice

The quality of the ability to take an active and independent role as an actor and developer

AND *The quality of ability to resist expectations of a passive role of a nurse*

The results concerning these two combined variables are presented together due to the fact that the analyses yielded identical outcomes. ED nurses, and MDs' sub-panels considered these skills quite identically: one half of the respondents agreed, while the other half disagreed with the statements measuring these sills. On the other hand, nursing managers appeared to be more prone to agree with the activity of ED nurses' role, and disagree with the passivity of the role. However, the difference was not statistically significant, either ($p = 0.224$).

Theme: Clinical competence and competence assessment

Quality of the mastery of theoretical knowledge, equipment, and procedures

The sub-panels' assessments in their entirety were in concordance, and demonstrated agreement on the adequate quality of these skills. However, it has to be pointed out that among the nursing managers' sub-panel one third, and MDs' sub-panel half of the respondents disagreed with the aforementioned.

Quality of the skill to assess patients' ability to breath and breathing load

AND *Quality of the mastery of biomedical theory*

Here, again, these combined variables are dealt with together due to the identical results of their analyses. A statistically significant difference was obvious between the assessments of MDs' and the other two sub-panels ($p = 0.002$). More than two thirds of the members of

MDs' sub-panel disagreed with the quality of the skills of an ED nurse to reliably assess patients' ability to breath and breathing load as well as the mastery of biomedical theory.

Quality of the skills to assess the level of consciousness and to react accordingly
Here, again, the sub-panel of MDs showed significantly more critical perception of ED nurse's skills to assess one of the vital functions and to respond adequately. The difference turned out to be statistically significant, as well ($p = 0.003$).

Quality of the skills to recognise problems of respiration and circulation
The appraisal of the respondents' perceptions of the skills to recognize problems in the other two vital functions yielded a significant contradiction between the assessments of MDs' sub panel and the other two ($p = 0.002$). Almost 75% of the MDs' sub-panellists did not agree with ED nurse' s ability to recognize obvious or impending/latent problems of patients' respiration and circulation.

6.3 Suggestions for the professional title of an ED nurse

All in all, 129 respondents representing 62% of all respondents expressed their perception of the professional title suitable to describe the profession of an ED nurse. Suggestions are presented according to the three sub-panels in Table 4.

Acute nurse appeared to be the most popular title for an ED nurse, even though nurse managers seemed to prefer *Emergency nurse*. However, 7.8% of the ED nurses' sub-panel regarded the title of *Nurse* as the most appropriate, and suitable also for future purposes.

TABLE 4. Suggestions for the professional title of an ED nurse according to the three sub-panels, frequencies and percentages.

Sub-panel		ED nurses (n=167)	Nursing managers (n=15)	MDs (n=26)
Suggested professional title (in Finnish)		Frequency/percentage	Frequency/percentage	Frequency/percentage
Valid	Acute nurse (Akuuttihoitaja)	52 / 31.1%	1 / 6.7 %	9 / 34.6%
	Emergency nurse (Päivystyshoitaja)	15 / 9.0%	6 / 40%	7 / 26.9%
	Nurse (Sairaanhoitaja)	13 / 7.8%	1 / 6.7%	1 / 3.8%
	First aid nurse (Ensiapuhoitaja)	8 / 4.8%	-	1 / 3.8%
	Nurse-paramedic (Ensihoitaja)	6 / 3.6	1 / 6.7%	-
	Trauma nurse (Traumahoitaja)	1 / 0.6%	-	-
	Others	5 / 3.0%	1 / 6.7%	1 / 3.8%
Missing	System	67 / 40.1%	5 / 33.3%	7 / 26.9%
Total (freq.)		167	15	26

6.4 The operational environment of future ED nurses - a micro and macro level view

This chapter is organised under two subtitles, which both deal with estimations of the operational environment of future ED nurses. Chapter 6.4.1 presents the results of the II Delphi round' s future-oriented statements comparing the three sub-panels' assessments. These data are slightly closer to the everyday clinical work of ED nurses, but can still be claimed to have a relevant relation to the heading of the chapter. A micro level view is provided. Furthermore, chapter 6.4.2 shows the four expert-panels' perceptions of the three alternative futures of ED activities demonstrating a more large-scale picture of the future. This might be called a macro level view.

6.4.1 The future as seen from the bedside (micro level)

The data are classified and presented according to following themes: A) Centralisation of emergency health care services, B) Education of nurses, C) Nurses' increased responsibilities, and D) Miscellaneous. These themes were derived from the anticipated social changes that had been on background of the whole study. They were estimated to possibly have influence on the phenomenon in the focus of the study, as was mentioned in chapter 3. The future-oriented statements in the questionnaire of the II Delphi- round had been, in turn, derived from the aforementioned themes. This part of the study aimed to obtain the perceptions of the three sub-panels in terms of the desirability and probability of the future-oriented statements.

A) Centralisation of emergency health care services

ED nurses were significantly more than the nurse managers and MDs prone to hope that the centralisation does not continue ($p = 0.006$). Yet, a clear majority of all the panellists considered it probable that the prevailing tendency of centralisation still continues. Unanimous perception seemed to be that ED nurses' skill to detect among those continuously growing flow of patients, those, whose condition is worsening remarkably, will be appreciated even more than currently. The same level of agreement was evident in terms of the future situation that in the ED patients are treated for several days remarkably more often than nowadays due to the shortness of places for continuous care.

B) Education of nurses

All sub-panels considered desirable that only nursing personnel with special education for ED nursing would work in EDs, but among the MDs sub-panel this wish was significantly more evident than among the other sub-panels ($p = 0.006$). Even though the theme deals with nurses' education, it seemed relevant to tie the issue of MDs' special education in emergency medicine to this theme. Should a speciality of emergency medicine be established in our country, it most probably would have influence on nurses' education, as well. The previously mentioned wish, in terms of a special education in emergency medicine, was unanimously expressed for the MDs working in the future EDs. However, none of the sub-panels considered either of these wishes to have potential to realize by 2020.

Regular evaluation of ED nurses theoretical as well as practical skills were considered desirable by all sub-panels, but only nursing managers regarded it as probable ($p = 0.002$). Nursing managers wished significantly more than others that, due to the fact that ED patients are getting older and multiproblematic, increasing substance abuse leads to growing social

and health problems, ED nurses would more commonly than today have a special education in psychiatry (p = 0.013). None of the sub-panels, however, anticipated this to realize.

C) Nurses' increased responsibilities

All sub-panels estimated it to be both desirable and probable that ED nurses' independent receptions, so called "minor injuries clinics", are running as an everyday routine. Yet, ED nurses demonstrated significantly more pessimism towards future ED nursing as a genuine, esteemed special area of nursing, with own special education program and an accepted occupational title; like a midwife (p = 0.002). Despite the continuously growing demands for clinical skills that may be hard for anyone to meet, the formation of two kinds of ED nurses, "intensive care ED nurses for the critically ill" and "nurses taking care of the basic needs of patients", was not considered either desirable or probable.

All sub-panels considered it as undesirable and improbable that the occupational profile of ED nurses is maintained like the current one, and the role of MDs' gets stronger. Furthermore, MDs' sub-panel was significantly more prone (p = 0.005) to regard it as undesirable that the occupational roles of ED nurses and MDs would be maintained as they currently are. This certainly leaves room for speculation in discussion.

Implementation routinely the methods of intensive care (respirator care, vasoactive drugs, invasive monitoring) in the future' s EDs was estimated by the MDs' sub-panel to be probable. The difference compared to the other two panels' perceptions was statistically significant (p = 0.001). No sub-panel, however, regarded this as desirable.

ED nurses were significantly more confident than the other sub-panels that by 2020 ED nursing has become so burdensome that hardly anyone can stay there for more than three years without a break (p = 0.003).

D) Miscellaneous

Virtually all respondents had expressed their wish according to which the whole domestic health care organisation would have paid more attention to ED action, which would, in turn, have yielded increasing amounts of research, follow-up and guidance of the work. The majority of nursing managers and MDs also considered this to be probable, while ED nurses were significantly more pessimistic in terms of the probability of this item (p = 0.03).

Even stronger consensus seemed to prevail regarding confidence in domestic nursing personnel and its availability for ED nursing purposes also in the future. Among all the respondents of the three sub-panels 192 had expressed their perception of this item, and only two members of the ED nurses' sub-panel considered it as desirable that in 2020 ED nurses would be mainly immigrants with nurse' s education. This view was regarded as improbable, as well.

All sub-panels hoped for better appreciation for ED nurses' work in the form of better wages and more valuation, but ED nurses themselves considered this significantly more often than nursing managers and MDs as improbable ($p = 0.001$). However, none of the sub-panels seemed to believe that this could realize. Neither did they believe that competent nursing personnel would be staying within nursing profession remarkably longer than currently. Severe compromising of the current kind of ED organisation of specialized medical care due to difficulty in getting competent nursing personnel was not considered probable. Yet, it seems reasonable to point out that 44 members of the 157 ED nurses sub-panel' s respondents, and more than half of MDs' sub-panellists had regarded this as probable. The level of statistical significance could not, however, be reached ($p = 0.065$), when compared to nursing managers. Nevertheless, this item is hard to ignore in future discussions.

6.4.2 The operational environment of future ED nurses – three alternative futures (macro level)

The scenario 'Business as usual' was anticipated to be the most probable alternative of the three scenarios to be realised in 2020 (Table 5). Twelve experts chose this alternative, while eleven experts chose the scenario 'ED nurses' occupational profile is evolving', and four experts chose the scenario 'The system is in danger of collapsing' as the most probable one. Experts were almost unanimous concerning the desirability of these scenarios, as 22 of them had chosen 'ED nurses' occupational profile is evolving' as the most desirable one, while two had chosen the scenario 'Business as usual'. It must however be stated that twelve experts' comments were either missing or so unclear that a definition of their choice could not be made. The frequency distribution of sub-panels (I – IV) responses in terms of probability and desirability of the scenarios is presented in Table 5, and will be discussed below. Respondents' comments and arguments concerning the scenarios are presented according to the sub-panels and organized to follow the previously mentioned themes on background of the study and having effect on the research phenomenon.

TABLE 5. Three future scenarios: Distribution of the responses in terms of probability and desirability of the scenarios according to the four sub-panels, frequencies.

Respondents	The most probable scenario	The most desirable scenario
	Scenario 'Business as usual'	
Sub-panel:		
I ED nurses (n = 9)	4	
II MDs (n = 7)	4	
III Central administration (n = 10)	2	1
IV Researchers, teachers, bystanders (n = 9)	2	1
Total	**12**	**2**
	The most probable scenario	The most desirable scenario
	Scenario 'ED nurses' profession is evolving'	
Sub-panel:		
I ED nurses (n = 9)	2	7
II MDs (n = 7)	1	4
III Central administration (n = 10)	4	6
IV Researchers, teachers, bystanders (n = 9)	4	5
Total	**11**	**22**
	The most probable scenario	The most desirable scenario
	Scenario 'The system is in danger of collapsing'	
Sub-panel:		
I ED nurses (n = 9)	2	
II MDs (n = 7)		
III Central administration (n = 10)	2	
IV Researchers, teachers, bystanders (n = 9)		
Total	**4**	
Some kind of mix of the scenarios	5	
Missing / unclear	3	11

6.4.3 ED nurses

Scenario 'Business as usual'
Sub-panel I consisted of nine nurses actively involved in emergency nursing. The scenario 'Business as usual' turned out to be the most probable one within this sub-panel, but no one considered it as the most desirable scenario.

Centralisation of emergency health care services
Economic pressures and requirements of efficiency have not permitted a cessation of the extensive centralisation of emergency health care services.

Education of nurses
The time span of 15 years was considered short for considering major trend changes in health care. In particular, the structures cannot be changed quickly, even though the methods of care and policies occasionally undergo fast-paced reforms. In addition, there hardly exists enough enthusiasm to change the modes of action; e.g. in terms of nursing and medical education: *"For example nursing training went to universities of applied sciences, but where is the real change? Nursing education and working reality still seem to be far from each other." "For example, in the scenario there exists a triage nurse, but what educational programme prepares a nurse for that?" "Nursing science is unable to get closer to emergency nursing and its requirements - no new means can be developed to master changing situations. "*Nurses' education was claimed to have been too theoretically oriented to be able to realise scenario II.

It was considered necessary that emergency department nursing, in order to develop towards its own field of expertise, should receive more interest from the MDs. As long as emergency medicine was not a discrete expertise within the medical profession, it was difficult to see it as having any hope for real development: *"Nurses can surely develop actual nursing, but if this progress is not supported by MDs and unless they are committed to it, no sensible progress can take place. ED nursing consists of very tight co-operation between ED nurses and MDs; co-operation can hardly be developed if both sides are not committed to it."*

Nurses' increased responsibilities
Economic prosperity within society has emerged in health care in a concrete way, even though health care has been valued, at least in speeches. The respondents felt that no additional resources have been allocated so that the prosperity could actually have been

experienced at the workplace, no time and strength has remained for developing the work. There have not been enough developers and role models, as outlined by scenario II. When employers have not afforded to raise nurses' salaries to a level that would have drawn enough good personnel to this field of activity, it has remained to be a 'calling'. Furthermore, because salaries have not risen there has not been a willingness to seek a way to further education and training, and so it has not been possible for the reorganisation of work to be radically developed.

Miscellaneous

Severe concern about the reality within ED nursing was expressed: "Scenario I should be taken off. Without determined progress there's no sense in continuing. A disaster will hit the action soon, if we only try to do business as usual." On the other hand, scenario I was considered to adequately describe the situation at the time of inquiry. The statements were considered to hold true: the numbers of geriatric and substance abusing patients have increased, and the implementation of methods of intensive care has been everyday routine. Patients' complaints have become more common, because in our society there has existed an 'everything to me and at once' trend: "Scenario I outlines a starting point, from which we have to begin a realistic development. This scenario is not desirable, because nursing science, nursing itself and medical science have brought, and keep bringing, challenges to the competence of personnel working in the EDs both at administration and clinical work. A broad competence is expected from a nurse."

Scenario "ED nurses' profession is evolving"

This scenario might also be called a scenario of '*Nurses' increased responsibility*'. Two sub-panellists considered this as the most probable, and seven as the most desirable scenario.

Centralisation of emergency health care services

Continuing centralisation has raised the level of care, but lengthened waiting times and increased dissatisfaction as well as aggression among patients and their relatives. Continuing centralisation has also resulted in growing queues of the most severely ill patients. Furthermore, the centralisation of care has (in the name of cost saving) led to growing expenses as patients have been continuously transported by ambulance to those few EDs still remaining. Some kind of level of primary health care should have been maintained by legislation.

Education of nurses

Issues concerning education of ED nurses were actively discussed. Where and how ED nurses should have been educated was considered an interesting issue. Universities of applied sciences seem to have been the appropriate facility, while scientific universities have not possessed competence in education of clinical work. Both the MDs and nurses working in the EDs have had to obtain a special education and training for emergency care.

Critical arguments were expressed to give reasons for this scenario: *"I cannot believe that going downwards from the current situation is possible. "*On the other hand, positive experiences have also been achieved, as there have existed educational programmes which have especially focused on improving clinical skills and ability to take care of patients independently. When nurses have been provided additional education, encouragement and additional financial reward for doing such a job that they have felt rewarding and in which they have been able to use their knowledge and skills and receive further education, it cannot have had anything other than a positive effect on that vision in question: *"I strongly believe that additional education will mainly be sought by persons with adequate preconditions. At the moment, part of this kind of nurses seek their way to medical school in order to get to fulfil these needs: independent decision making and to learn more." "A multi-skilled nurse can only be developed by working experience, education and clinical practice. Thus, I strongly support circulation and ED nurses with certain specialisms, e.g. psychiatric nurses, mid-wives etc." "It would be heart-warming if some kind of education would be offered to and a certain level achieved by the whole staff (MDs included)."*

Education has provided clinical skills and the basis for actions taken. In the EDs, patients have been treated more and more effectively: *"For example, PTCA has already passed coronary by-pass surgery as the treatment of choice and PTCAs will be performed even more commonly as an emergency procedure. There may exist coronary laboratories and stations by the EDs in the future with staffing on a 24 / 7 basis."*

Where and how ED nurses have been educated was considered an interesting issue: "I wonder if the additional education of nurses to the level of master or candidate within the educational programme of clinical nursing will be possible. At least currently the educational programme of clinical specialist in nursing science does not by any means respond to the challenges posed by acute nursing care. Studies in nursing sciences, despite the side-subject (the education of nursing teachers excluded), aim only and merely at educating researchers and at

detecting them among students of master of nursing science. I think that if things continue to be the same, the gap between practice and theory will not diminish. The education of clinical specialists and acute care should be planned to be an addition to the education of nurse-paramedics or somehow so that it could respond to the challenge posed by emergency nursing."

"Realism has also to be preserved in terms of modern society's wages and their progress. Basic care workers are needed, not nurses' with master's degree, to carry out the basic care in the EDs." Employers have increasingly provided education for their employees: "Clinical practice will be conducted in collaboration with EDs so that it will be clinical work-oriented and motivating. A good example of this is the additional education of ED nurses provided by the University of Applied Sciences of Arcada." Other comments supported this kind of approach: "The educational programme of an emergency nurse will be developed based on either Universities of applied sciences or on Universities, but will initially take place as education at work."

"Nursing science should descend from its ivory tower to the grass root level for developing practical working methods. Nurse's profession should provide career advancement potential also for such nurses that are willing to do practical work". "Hopefully this kind of way of thinking is wakening (see e.g. wound-care nurses) and a career advancement like this would be made possible."

It was wished that special educational programmes for both ED nurses and MDs would have been established in order to obtain an enhancement of the culture of ED care to the same level as in the pre-hospital emergency medical care.

Emergency nursing programmes have been reasoned for by public savings and by responding to the growing inflow of ED patients. The issue of savings has been caught along with patient triage, the nurse's receptions, and the grown responsibilities of nurses.

Nurses' increased responsibilities

Patients' satisfaction with the services has increased, when they have got for example to the nurse's reception, but the complaints, concerning especially nurses' treatment decisions and the fact that patients did not after all get to the reception of an MD, have increased. Complaints concerning malpractice have also been seen more easily and more often.

Co-operation with MDs has certainly improved when nurses' appreciation towards their own work and professional expertise has grown and an MD has been perceived more like a consultant providing support for nurses' own decision-making. In this way the MDs have also been able to trust better in the decisions made by the nurses. Availability of staff for EDs has been better than for ordinary departments. Strong statements were given in favour of more permanent staff for EDs: *"The staff has to be permanent. MDs have to start working in three shifts preventing the current continuous changing of MDs. The scope of practices have to be balanced – it has to be moved on from the ways of 1960's thinking. It is a matter of precise education."*

The profiles of EDs should have been elevated as the work has differed a lot from other hospital work both in terms of qualifications and conditions; it would have been reasonable to obtain respect on the same level. With additional education and development of the distribution of work, it can have been made reasonable for (almost) every employee: *"The idea that nurses must possess a strong professional competence appeals to me. Thus, in the future there can't be excessively "green" or inexperienced nurses in the ED." "Currently we are lacking quality, education and a whip. I am jealous of the pre-hospital workers, the quality of care falls when the hospital is entered!"*

Miscellaneous

With reference to the scenario and the outlining of the scope of ED nurses practice there it was suggested that the evolution of ED nurses' profession should have been described better. In the model presented now, a profession of a 'mini-doctor' was claimed to have emerged. Additional things suggested to be changed in the scenario especially concerned the issue of wages: *"Current level of wages and the insignificance of the personal bonus paid for individual skills and competencies do not motivate. If more responsibility, skills and competencies are required, a relevant reimbursement must also be received. Currently there certainly does exist sporadic so called* '*alert*' *nurses, who are interested in things and developing their knowledge and skills. However, if real urge for studying and additional training is to be caught, a concrete benefit is expected by most."* All in all, the matter of wages has risen to be a big problem, and it may have turned out that the scenario has been realised partially for example at private hospitals and at the biggest trauma centres, while central and local hospitals have been struggling with scenario III. Nurses have been running receptions based on consultation at peripheral primary care centres very independently.

Even though this scenario was considered widely as the most preferable one, its realisation was considered to have been facing obstacles: *"This is improbable as such a profound clinical competence described in the scenario is possibly not yet appreciated enough."*

Scenario 'The system is in danger of collapsing'

Two members of the sub-panel consisting of emergency nurses chose this scenario as the most probable, while nobody as the most desirable one: *"The most probable scenario. The description of this scenario is exactly what I think about ED and its situation currently in my town, alarming. Many of the unwanted phenomena described in the scenario can clearly be discovered already."*

Another comment emphasising the emergence of issues presented in this scenario, was expressed: *"Lack of personnel will be a reality, motivation for basic work will decrease and only the most necessary will be done. Burn-outs will occur more frequently. The mid-level management loses their grip of the practical management, the time is spent for acquiring substitutes and other necessities. This, in turn, may lead to excessively fast-paced changes of the managers and to a new chaos (continuously a new manager)."*

Education of nurses

"A well-educated nurse of the future is in-between of a nurse and a MD; does it lead, for the MDs part, to such a situation that all unpleasant work is having to be done by nurses, and MDs themselves pitch and run?"

6.4.4 MDs

Scenario 'Business as usual'

Four panellists had considered the continuation of the current way of doing things as the most probable future, but no-one as the most desirable one.

Centralisation of emergency health care services

This sub-panel did not comment at all on the centralisation of emergency health care services.

Education of nurses

Education of nurses has been far too theoretical for scenario II to have been realised. Nurses' willingness to undergo further education without significant reimbursement, and MDs' eagerness to work in the ED were also questioned: *"Who can offer such a bait that current ED nurses would apply to an educational programme aiming at ED nursing specialisation?*

And who can make MDs understand that an ED does not have to be a 'salt mine', but a splendid working environment full of opportunities?"

Several constructive suggestions were made by this sub-panel. It was mentioned that as there clearly has existed a demand for and a chance to establish a profession of an ED nurse, a structured educational programme should have already been under way: *"The educational programme of ED nurses would be wise to tie up with the educational programme of emergency medicine in order to educate these two professions to co-operate from the very beginning of their special education."* The time-table for the educational programme of emergency medicine has not been swift. Throughout the country's EDs there have been senior MDs in charge of each ED, but they have been mainly MDs with their specialisation still ongoing. The situation is not expected to change by 2020 so that each MD, in charge of an ED, would be a fully licensed specialist.

Nurses increased responsibilities

As reasoning for the realisation of this scenario, such issues were mentioned as: *"Changes happen very slowly, if we should be ready by 2020 the changing of structures should already be under way",* and *"It is hard to change the models of action, not to mention in the chaotic everyday life of overcrowded EDs."* An impression of fatalism could be sensed from one respondent's comment: *"I am afraid that feelings and attitudes lead us to scenario I".* It was also mentioned that there have not existed enough developers and role-models for scenario II to be accomplished.

On the other hand, there has also been an openness to different kinds of thinking: *"An unprejudiced change of the model of action and redistribution of traditional turfs might bring a change also to dated ways of thought. I think it is time for a change. In Finland we are still far from such a swamp of legal actions and issues of responsibilities, machined by insurance companies, as is the case in USA and to some extent in GB, too. Here the responsibilities can be distributed to representatives of different professions according to each one's education competence. If the action can be made more effective, the issues concerning responsibilities are not going to be a problem even from the point of view of the hospital management."*

Scenario 'ED nurses' profession is evolving'

One sub-panellist had chosen this as the most probable scenario, and four as the most desirable one.

Nurses increased responsibilities

Arguments in favour of the decisions were provided sparsely, but all those having chosen this scenario as the most desirable one had also justified their view: *"This is the most desirable scenario. It aims at far to the future by making progress and helps to manage the overcrowding situations of EDs."* Some of the EDs would have obtained this kind of level of action by 2020, and would have acted as antecedents and examples for others.

This issue seems to have raised emotions: *"I hope that common sense wins and scenario II will realise."* On the other hand this scenario was criticised for failing to properly describe the distribution of work between health care professionals: *"What does the emergency nurse not do?"*

6.4.5 Central administration

Scenario 'Business as usual'

Two panellists chose chosen this scenario as the most probable, and one as the most desirable. Some kind of mix of scenarios I and II was anticipated to be the most probable future by one panellist.

Centralisation of emergency health care services

The centralisation of emergency health care services was not commented on by this sub-panel, either.

Education of nurses

However, it was mentioned that education of nurses, providing insufficient practical preparedness, has not been intensified sufficiently that it would have been possible to get even close to an independent ED nurse's profession as described in scenario II. On the other hand, that scenario (II) outlines such tasks for nurses that according to the legislation prevailing at the time of inquiry have been solely dedicated to the medical profession.

Nurses increased responsibilities

One panellist considered the whole idea of 'a reception of minor illnesses and injuries' within an ED absurd: *"Those belong to be treated in primary care!"* Changes to this scenario were suggested, as follows: *"The scenarios could have been seasoned by some visions of the changes in morbidity and its possible effects on the workload – in this study ED nurses only pay attention to themselves."*

The probability of scenario I was mentioned to having been promoted by issues as follows: *"Other parts of our health cares system, especially primary and home care are starting to take their responsibilities remarkably better than currently. That leads to diminishing emergency health care problems for example within the geriatric population. Parts of scenario II will complement the current model (scenario I), especially the standardisation of working processes, redistribution of tasks to some extent and systematic development of competencies including evidences of keeping up the competence."*

Scenario 'ED nurses' profession is evolving'

Four members of this sub-panel considered this scenario as the most probable and six as the most desirable one. This scenario was said to contain many such elements as have already been realised in many countries, e.g. in the USA and GB.

Centralisation of emergency health care services

ED actions have been, along with the established municipality reformation and because of cost-cutting efforts, centralised even more. A policy of having a triage nurse in each shift has been absolutely necessary in centralised EDs. Positive experiences from similar actions within large operating units have previously been gathered.

Education of nurses

"I would regard scenario II, when implemented well controlled, as desirable. This kind of enhancement of the preparedness of emergency health care services at out-of-office hours for those needing immediate help would provide additional reasons for further centralisation of demanding health care services."

The progression of the profession according to scenario II has been possible in those big EDs that had already begun to develop at the time of inquiry. Nurses with candidate and master's level education have formed only a part of ED nursing and that has required nursing and medical leaders to be capable of visionary management. A gloomy outlook for those EDs where they had not already to think about the visions outlined in scenario II and business has gone pm as usual, is evident. Scenario I, or at its worst, scenario III, has been realised. Development has not depended merely on the management, but it has also been about a certain lack of professionalism and vision. At its worst, even the value and possibilities of further education have not been understood. These kinds of units have been commonly found in Finland.

The worst choice has been that either the personnel or the management has not understood the trends of and demands for development. The developing of an ED has taken more than ten years and required unconditional systematic work from both the management and staff. It has also required that universities, universities of applied sciences, and the world of work have planned and executed this vision together. The support of health care districts' management has also had to be behind this.

These issues came up strongly in the discussions. The central administration had become aware of them in terms of the progress of medicine and nursing, mastering of entities, competence and economic efficiency. A strong emphasis had been place on taking care that manual skills were developed; the educational programmes must have included enough long periods of clinical practice in different working circumstances.

Even more specialisation for emergency nursing has been needed, but the education has occurred in connection with further education at universities of applied sciences, and only some have received a university degree. Further education at universities of applied sciences represents at such a high level as to have equalled a 'nurse practitioner' educational programme. A university level degree has equalled a so called 'advanced nurse practitioner' programme. Further education to master's level has also been provided as specialisation and additional education at universities of applied sciences. Persuading MDs to provide education may have emerged to be a problem. At least in the beginning of such educational programmes the education cannot have been provided by the nursing profession itself. Part of this kind of education has required MDs to provide it, even though some of the educators have been emergency nurses with special education.

A point of view was presented as an obstacle for scenario II to having been realised. Within our nursing education, the approach has been to improve a nurse generalist' s competences. As the education time has always been limited this may have led to superficiality of acquired competences, while profound competencies may have been in danger of being left aside.

An interesting suggestion was made: *"Maybe we would need a totally new health care educational programme for patients with substance abuse problems. It might be useful also in the ED."* Patient safety has risen to be a priority within all health care educational programmes and management. Development of the processes has also had an impact on reducing the incidence related to multi-resistant bacteria.

Nurses' increased responsibilities

Nurses' independent working has increased, and tasks have been redistributed to them from MDs. At the same time more responsibility for patients' holistic care has been allocated to nurses. It has not been a question of distribution of some individual tasks. In connection with the distribution of work, nurses' counselling and education work has been emphasised as well as the co-ordination of a patients' care, which have for a long time been done by nurses working in EDs.

The distribution of work between different professionals has been reorganised especially as the use of hired MDs in the EDs has increased. The medical profession has become more and more female, and female MDs have not been so willing to take care of on-call duties, especially in those laborious EDs. We have had to increasingly trust in the hired MDs. This has meant that the permanent staff, including specially educated nurses, have had to take more responsibility for general organisation and action. Department unit managers have become more like managers and department leaders in EDs, where different specialists, including MDs, have been providing their specialist services.

It has taken years to reduce MDs' traditional entitlements, mainly because of the heavy resistance of their trade union. Certain alleviations have taken place in the form of nurses' restricted right to prescribe, and entitlement for writing certifications for sick leave. However, MDs have not given up their entitlement for setting a diagnosis and making decisions concerning the patient's care. It has been questioned whether even that is necessary, even though it is in any case action in accordance with an MD's expertise and education. *"All the work cannot and should not be redistributed",* as one respondent has described.

Economic pressure has led us to transfer tasks from MDs to nurses. This has, however, been everyday routine in the pre-hospital settings. This can have been seen as one way to withstand the ever developing lack of personnel, by providing challenging tasks at magnet hospitals.

It has been necessary to hire also a work force with lower level of training to EDs, for routine and supportive purposes: *"If there should appear some kind of dividing of personnel into castes, it will touch other expanded scopes of practices, as well."* Furthermore, these have been issues of management and culture.

Working in multi-professional teams, so that the professional competence of everyone has its place, has increased remarkably. Nursing personnel have been well motivated and their wages

have been determined on the basis of the demands of their work and personal qualifications. This has, in turn, inevitably raised the level of salaries in the EDs. The importance of EDs has increased and they have been resourced accordingly. Thus ED work has been desired and problems in acquisition of staff have not been especially encountered when there has existed a dedicated educational programme for ED nursing purposes.

Miscellaneous

"The most probable scenario will be found somewhere between I and II." Factors that have promoted the realisation of scenario II have been as follows: "This would enable to scrutinise the process of a patient' s care as a whole, home – pre-hospital EMS – ED. Part of the patient's health problems could be taken care of by ED in co-operation with primary and home care. Other parts of specialised medical care would be able to focus on the development of elective processes."

It has not been certain that the processes of a hospital have been guided by the protocols adopted in the ED as a starting point. A perception of the action that has been desired has guided the distribution of work and the development of competencies.

The emphasis placed on the independence of professions was considered to have been an unwanted word. It would have been better to translate it to the language of working processes and the success and competence of teams; thus it might have turned out to be a promoting factor. This was a point of view that should have been specified within the scenarios: "*Regular assessment of theoretical knowledge and clinical skills may lead to administratively burdensome and expensive solutions. The re-assessment of competence might be appropriate according to certain criteria, e.g. when protocols of care are changing or the scope of practice is increasing, or after a long absence from work."*

A suggestion was made that the co-operation and teamwork of MDs and emergency nurses could have been described in terms of their meaning and precondition. They both have needed each other in order for the model to work.

Acting according to the scenario has not, however, prevented all the problems: "Complaints have still been made. Their processing both with patients and multi-professionally, as well as making use of the information produced by the complaints, has intensified."

Scenario 'The system is in danger of collapsing'

Two members anticipated the most probable future to be as described in this scenario: *"This will be our future, unless it is quickly invested in education and development according to scenario II."* Issues also to be implemented quickly were mentioned to be the availability of personnel resources, wages and the processes of action in the EDs: *"This will be the consequence, if we can' t manage to lift up the profile of ED work. This is related to the working of other components of health care organisation – primary care, pre-hospital EMS etc. all work apart."*

6.4.6 Researchers, teachers, bystanders

Scenario 'Business as usual'

Two members chose this future as the most probable, and one as the most desirable one. Initially, one respondent within this sub-panel expressed heavy critique towards the scenarios. They were considered to be purposely biased, and it was mentioned to be obvious that the researcher was expecting scenario II to be a desirable and the most probable alternative. Nonetheless, the respondent made valuable comments and suggestions for improvements, as presented in the next paragraph.

Centralisation of emergency health care services

"The centralisation will fade after 2010. Then the reformations of the structures of communities and services will start realising: communities have been united and social and healthcare districts have been born. The level of work force is reducing. Legislation, the guarantee to care, has been specified according to the suggestions of 'Evidence based care'. Time limits for examining the patients have been defined, at least a definite time limit, which cannot be crossed."

Education of nurses

Education of nurses has needed serious reforms: *"Based on very limited knowledge I point out an issue concerning a problem within the basic vocational education of nurses currently. It does not provide, even according to the results of scientific research, sufficient preparedness for the resuscitation of a lifeless patient, for taking a high quality ECG or to carry out safe pharmaceutical care (i.e. medication calculation skills). Observed from this point of view, the whole nursing vocational education should undergo a reform, which can hardly happen quickly (see the development of the paramedics' education)."*

Specialisation studies within nursing education have been developed. In ED nursing there are more paramedic-educated persons. The structure of the staff is more homogenous, comprehensive competence is needed. It was considered important that the competence is comprehensive so as to enable movement of the work force. In-service education is continuous; competence is reviewed under development discussions. However, it has not been cost-effective to base the registration on given evidence of competence.

Nurses' increased responsibilities

The model of implementing triage- nurses and their job description has been developed, but the actual triage of incoming patients has already occurred in the pre-hospital phase by pre-hospital personnel: *"With the aid of pre-arrival notifications and developing data-transfer: a picture of the patient and possible disturbances of the vital functions are already known by the triage-nurse. An actual independent triage thus only takes place with patients coming from other routes or by other means than ambulance."*

Methods of functioning distribution of work have been developed according to the additional programmes of the National health care project. Within the reformations of the structures of functioning of communities and services, treatment policies have been developed according to each patient group: *"ED work will still be part of health care services and it needs to be assessed and developed as part of the whole concept of services." "Lack of work force and especially lack of competent personnel with special education has forced to pay attention to resources and job satisfaction."*

Miscellaneous

Extrapolation of history was also used as reasoning for considering scenario I as the most probable: *"When looking backwards to the period, when pre-hospital emergency care started to develop, and its model of action and methods could utilise broad research based knowledge, it has to be moved up to mid 1980s. When considering the progress that has taken place during 20 years, it can be noticed that the same obstacles for holistic progress still exist as was the case 20 years ago. Conflicts of interest, local governments' autonomy, conflicts between different professions, and to some extent still somehow incoherent education systems are still disturbing the progress."* It was considered hard to believe how an even more bureaucratic environment such as an emergency department might have progressed to be such an emergency care centre as outlined in scenario II, and where the nursing profession would appear as also presented in scenario II.

Scenario 'ED nurses' profession is evolving'

Four members of this sub-panel had anticipated the most probable and five members the most desirable future to be as described in scenario II. A strong statement in favour of the realisation of this scenario was expressed, as follows: *"There's not the slightest doubt that scenario II would not be the most desirable. As some kind of modification it is also probable, models like that are already being tested, also in Finland."*

Centralisation of emergency health care services

According to several respondents within this sub-panel, the centralisation of emergency health care services has continued. Regional models of the structures of services have created preconditions for centralisation, while artificial borders between primary care and specialised medical care have vanished. These issues together, with a shortage of medical work force have acted as a driving force for developing an ED nurse's profession. The work of both MDs and nurses has been rationalised.

An additional relevant point of view was brought for discussion: *"Another group of factors is connected with the actual differentiation of medical specialisms. For example, within surgery they get the specialisation for maybe no more than one sub-speciality. After that an orthopaedic surgeon cannot perform a laparotomy for a gastroenterological patient and vice versa. That is why the EDs will continue to be centralised, thus it is possible to keep up in a cost-effective way several sub-specialisms"*

Education of nurses

It can hardly be claimed to be a surprise that this sub-panel pointed out numerous issues related to nursing education, which has faced powerful challenges. When the work poses more challenges and demands, new requirements are also set for further education and specialisation during basic vocational education. Unless nursing education is able to accept the challenges it has faced, a new profession for emergency nursing may have been born.

The two-column high-school system has been maintained in Finland, and upper high-school degrees of universities of applied sciences have established their status beside master's degrees of universities. At some bigger universities of applied sciences it has been possible to take an upper degree within the programme of emergency nursing, which has provided preparedness to work as an ED nurse and has equalled the qualification of a nurse practitioner: *"In the future there will be a greater number of well educated ED nurses, who*

are ready to take a bigger responsibility of the work. I believe this to be important because of the sense of the work."

Nurses increased responsibilities

"Above all I hope but also believe in the realisation of scenario II. Current progress indicates that." "Simultaneously there naturally exists fear for the realisation of scenarios I and III. The threats are clear, but I believe that there will be willingness to invest in the most important area of human service work." The attraction of the nurse's profession may have been enhanced by the expansion of scope of practice and the addition of responsibility – especially, if this has been taken into account in terms of wages.

"The road is already paved towards the direction expressed in scenario II – everything does not have to be invented by ourselves, there are international examples that have been tested for years. So there exists research and evidence based facts to support this development." "The redistribution of work for nurses releases valuable medical resources and is economically wise. To some extent, this may require additional education, but mainly it is a question of changing the attitudes." Furthermore, these new competencies can have been exposed to tests, as described in the scenario. Thus the threat of complications caused by incompetence has diminished to an almost non-existent level. At the time of inquiry there already existed willingness to bring such indicators to the competence descriptions of nurses, that the basic tasks should have included setting working diagnoses, writing certifications for short-term sick-leave, and a limited right to prescribe.

In several comments it was wished for the establishment of emergency medicine as a medical speciality, which, in turn, has promoted the establishment of emergency nursing specialisation and the policy of triage-nursing. Appropriate attention to severely congested EDs has required a new distribution of work and professional development. Consultation between different groups of professionals (not only MDs) has been everyday routine. This has occurred more and more via the internet, which has provided the possibility to consult the best experts across the borders between organisations. Nurses working in the EDs have possessed not only a strong evidenced based clinical competence, but also competence in information management as well as in management of change and development.

This sub-group emphasised that the approach to ED work has been multi-professional teamwork: *"The multidisciplinary co-operation has undergone such a progress that each one*

has a mutual clearly expressed goal in terms of the patient's care, and the expertise of the whole team is utilised for the benefit of the patient. Along with the multidisciplinary working model it has got rid of such a model according to which people only carry out tasks in relation to their education." "Preferably there will act multidisciplinary teams consisting of special expertise gathered by education and expertise from different fields of action." A social worker has been part of the multidisciplinary team working in ED on a 24/7 basis.

A reform in our health care system has been inevitable to be able to respond to the challenge posed by the increase in casualties and multiple health problems related to ageing of the population, social marginalisation and substance abuse. One method of development has been to move over to work in multi-professional teams and a redistribution of the responsibilities. The step required for change and acceptance has been lowered by additional education.

Miscellaneous

ED work and pre-hospital emergency care have maintained their internal development. Transportation, information technology, hardware, the rising competence (paramedics) have required specialisation just for this field of special expertise. Citizens' level of demands and a zero-tolerance in terms of malpractice and misjudgement have led to the fact that they are not tolerated by society, and that has put an even bigger pressure on triage-type screening and logistics.

Requirements for the progress outlined in scenario II were mentioned as being as follows: *"Problems cannot be solved merely by developing the nursing profession and changing the occupational title. The motivation and coping of nurses' depends on the general health and social politics and how they will be managed to functionally unite so that cost-effectiveness is improved. The main emphasis ought to be put on solving the basic problems and preventive nursing care. Unless this is implemented, the problems will cumulate and lead maybe to 'the collapse of the system' in the EDs due to frustration, lack of rewards of the job and exhaustion.*"

Some modifications were suggested: The policy of nurses' reception and increasing responsibility have not required additional education at university level, albeit its amount has grown. A solid base for change has been created by the partial move of paramedics from pre-hospital emergency medical care to ED nursing. One reason for this has been the keeping up of one's own professional competence and better wages. In addition to this, the staff has

sought their way to additional education in universities of applied sciences. Nurses with the education of a clinical nurse specialist have been placed at nursing receptions. There the patient has been viewed and taken care of in holistic co-operation with a substance abuse care worker, mental health care and social worker, whose receptions also have taken place in the EDs. Thus, the continuity of care and response to the basic problem of the patient has been secured, so the recurrence of the situation can most probably have been prevented. Paramedics have respectively been placed at immediate emergency and acute care tasks.

Finally, a notion was offered according to which acute care is a super-ordinate concept among other things for ED care, intensive care, pre-hospital emergency medical care and generally speaking for any care by which a patient's suddenly changing state of health is responded to. Thus it was considered impossible to choose this to be the occupational title of nurses working in the EDs. Preferably multidisciplinary teams will function consisting of special expertise gathered by education and expertise from different fields of action.

6.4.7 Annexes and eliminations to the scenarios

All in all, four panellists did not clearly express their perception of the probability and twelve of the desirability of the scenarios. Furthermore, five panellists considered some kind of mix of the scenarios to be the most probable.

ED nurses

"The future vision is shocking. Patients with no relatives to fight for them, will be forgotten…" "The hospitals will probably be dirty and uncared."

MDs

"Scenarios I and II will overlap in the future. There may exist areas where scenario III is a reality."

Sharp criticism was expressed towards the construction of the scenarios for them not being actually alternative and not to form a basis for expert assessment. The scenarios were said to differ only in terms of the fact of whether the scope of practice of an ED nurse has been developed towards the scope of a triage nurse's practice. To support the scenarios, a large range of consequences, independent of triage nurse's action, was said to be expressed. The entities, described in scenarios I – III, were said to be not realistic.

Delphi- method was, however, considered as a valid research method. It was further stated in the analyses, concerning congestion of EDs as presented in international reviews, that it has been shown that the keystones are the lack of places for continued treatment and, in connection with that the acute hospitals' annual degree of utilisation exceeding 85%. Also the relationship with other factors, as the supportive services, e.g. the delay to radiological services and relationship between the daily pace of the action and the presence of staff, are essential in terms of fluency of the action.

"As the EDs are centralised, it feels absurd to direct to other occupational groups those tasks, to the caring of which the medical education provides the best preparedness, i.e. the tasks related to diagnostics and treatment decisions. At least in the EDs of specialised medical care this model of action does not feel sensible."

Central administration

The scenarios were regarded as interesting. Scenario III was considered quite strongly coloured and surely one that the very wide-spread realisation of which in our country would be out of the question; it would not be tolerated. Instead of that, in some combined EDs (primary care and specialised medical care) this kind of development was claimed to be already in progress. Solutions for aggressive problems are sought, but they are not easily found.

All the scenarios were assessed as suffering suffer from the same problem, they do not respond to the question of what happens at the primary care receptions for out-patients during the actual office hours. We have quite unnecessarily become accustomed to this very distorted situation, where, despite all the efforts made, a quite remarkable proportion of the visits to a primary care MD or nurse seem to occur outside office hours in the EDs. As the service during daytime cannot respond to the demand and as the EDs are centralised, massive and hardly manageable service units will be born. It seems as though the action is run on the unexpressed principle, according to which, with long queues and waiting times, in practice the patients are discouraged from entering the ED. It was claimed that there does already exist a perception, according to which the combined ED of one region is a chaotic place, where a visit takes a whole day with a packed lunch, and there is reason to calm yourself down already in advance because of the many frustrations to come. Further development of this kind of scenario results in collapse of public health care. It also hampers quite severely the execution of adequate, sensible, first aid natured ED work.

The care of patients in need of urgent assessment and first aid natured care, who would be directed mostly to the domain of an ED and often also to the observation unit or other ward of specialised medical care, should be implemented effectively and without delays. The respondents' opinion has been expressed in favour of expanding the scope of practice of a nurse doing this job, and *"there should not be any specific problems there."*

The use of a telephone and web-based advisory system as a support method for EDs was suggested. All the telephone traffic concerning patient matters could be guided via professional tele-nurses and thus relieve the pressure in the EDs – this would be an essential part of the ED team. Lab. results etc. could be mediated via telecommunication for patients. A web-doctor or a nurse would always be available. Social workers would work as one professional group in the EDs.

It was stated that there does not exist evidence indicating that even if we were to achieve the development described in scenario II, that it would have such impacts as described on patient satisfaction. Experience has shown that people's level of demands grows at least as fast as the level of services offered. Only fast, far-reaching alterations in the availability of services may be in direct relation to patient satisfaction. The impact of the level of other care is much more complicated to demonstrate. Handling of the patient seems currently to be more significant than the technical level of the care.

Researchers, teachers, bystanders

One respondent elicited critical issues in terms of violence, intoxicating agents and other factors of insecurity possibly presenting an additional challenge. There are reports indicating that a proportion of the staff does not have the courage to work during 'unsocial hours' in small EDs. Furthermore, it was asked, whether triage-nurse/MD teams, organised into mobile groups, could in practice co-ordinate in those remaining 20-40 ED units the whole Finnish highest-level ED and pre-hospital emergency medical care actions? They might also have the possibility to organise the optimal patient logistics in the whole country, according to the distribution of work between hospital districts.

6.4.8 Final annexes and eliminations by the review- panel

The results of the III round were actively commented by the final panel, which will, due to the nature of the task of reviewing the previous results, be called the review panel. However, the review panellists mainly commented on the results of the sub-panel they were representing at

this final stage of the study. To safeguard the anonymity of the review-panellists, the comments of this IV Delphi round are provided anonymously and mainly as a product of the whole panel. To summarise, the scenarios and the comments related to them were considered realistic, sensible, and trustworthy.

The representative of emergency MDs wanted to emphasise several items, as follows: *"A certain optimism could be noticed among the arguments"*. Especially the awareness of the prevailing situation of ED care, not merely the problems, and the optimism in terms of futures' possibilities demonstrated by central administration was valued, and regarded as promising for the futures' development. Whatever the future role and scope of ED nurses' practice will be, it most likely is worth serious consideration that triage nurses could initiate the diagnostic procedures, including especially laboratory tests and the most common x-ray studies: *"The expedition of reaching definite diagnosis, and ultimately shortening the through-flow time, might be significant"*. This in spite of the fact that even the most sophisticated solutions for organising ED work cannot alone solve all the problems of the treatment chain, as has quite recently been demonstrated by Mattila et al. (2008).

Respectively, ED nurses' representative expressed some concern at the arguments provided to justify the choices made: *"It looks like they are sticking to minor points like current regulations rather than trying to genuinely seek alternatives for expediting ED care, and making the distribution of care more reasonable from everyone' s point of view"*.

Scenario 'Business as usual'

It was speculated whether the first place of this scenario among the sub-group of ED nurses in terms of probability might be due to the nurses' assumed pessimism towards the development of their working life in practice. However, development was clearly wished for.

Centralisation of emergency health care services

Some concern appeared to be caused by the low level of interest towards this issue, as decisions about this matter will be far-reaching in many ways. Lack of work force has been realised in a concrete way already, which causes new problems.

Education of nurses

The concern expressed during the III round was shared, and the acclaimed excessively theory-orientated education was considered to be needing a change of direction so as to be more clinically-oriented. Progress towards this direction has occurred in any case. It was assumed

that significant changes towards this may be time-consuming. The specialisation studies within emergency nursing care will be expanded and intensified. The parallel education of nurses and MDs was strongly advocated due to the encouraging and almost unanimously positive feedback obtained from the pilot projects.

Nurses' increased responsibilities

The importance of triage- nurses will be growing, and the accuracy of triage decisions will be scrutinised more closely than at present. Inaccuracy in these decisions might take the patients involved into inappropriate observation and care. The quality control of the work will be increasing, and nationally approved standards and criteria for quality might even be possible. The importance of clarifying the distribution of work between primary care and specialised medical care, as well as between nurses and MDs, was emphasised.

Miscellaneous

The realisation of this scenario was considered quite possible, and this should waken the decision-makers to begin considering reforms of the training. Unfortunately, the obvious contradictions between different stakeholders, e.g. hospital staff vs. EMS staff, have not faded, but belief for a better future was expressed.

Scenario 'ED nurses' profession is evolving'

This scenario was also called a scenario of '*Nurses increased responsibilities*'

Centralisation of emergency health care services

Some figures were hoped for illustrating the extent and consequences of the centralisation. It is worth noticing that one review-panellist demonstrated slight doubts towards the inevitable centralisation which was commonly accepted as one of the most probable views of the future. Instead of merging district and local hospitals to form a few mammoth-like hospitals, small hospitals have begun to increase in number and to establish co-operation with central and university hospitals more tightly.

Education of nurses

The comments of the III round were largely shared. It was regarded as a positive phenomenon that the education-related issues had woken active argumentation. A strong emphasis was placed on the development of nurses' education towards more clinical orientation, which was mentioned to be heading in this direction already. The dual-model will obviously stay, but, on

the other hand, changes can sometimes occur quickly, and nurses' education has been moved to universities in many European countries.

Nurses' increased responsibilities

A concern was expressed about such a view of the future that EDs might be comprehensively outsourced, which would result in growing responsibilities and competence requirements for the permanent nursing staff. This is an issue worth raising for a discussion which has not come about yet. When considering the provision of emergency health care services as a whole, a serious discussion should be conducted in terms of all the risks related to e.g. outsourcing.

Economic pressures were mentioned to be only one reason for the consideration of redistribution of work. Process-related reasons, such as the speeding up of the patients' service, were mentioned as one example. When executed with careful planning and follow-up, enhanced preparedness of nurses works in favour of all the stakeholders, and the risks can be controlled according to the experiences of domestic nurse-paramedic education and international experience. The possible appearance of the specialism of emergency medicine will radiate around in a beneficial way. Management and mediation of information as well as communication will pose major challenges of competence in the future. Fluent and intensive co-operation with relevant public authorities and occupational groups will be needed.

Miscellaneous

It was emphasised that new kinds of skills, in addition to those related to advanced emergency nursing, will be required. Acute disturbances of mental health, social emergencies (children, the elderly), and patients suffering from substance abuse problems are examples of patient groups needing adequate response. High expertise in the field of acute care will be needed in every case, and that can be achieved by university level education guided towards this field.

Scenario 'The system is in danger of collapsing'

Great concern was expressed due to the observation that this scenario was perceived as being a reality already, and the review panel supported this view, albeit not unanimously. It was also mentioned that the scenario will be realised unless active preventive measures are immediately taken. The profile of ED work has to be elevated through prompt measures by various stakeholders.

6.5 The clinical skills required from ED nurses in 2020

6.5.1 Possible transfer of tasks to ED nurses – top five

The preferences of the sub-panels' in terms of the five most important tasks the transfer of which for the responsibility of ED nurses should possibly be taken into consideration are shown in Table 6. It is noteworthy that over 70% of all the panellists had expressed their view of this item. Ordering of lab. tests and x-ray examinations were ranked among the top three priorities by all sub-panels. ED nurses seemed to prefer suturing minor wounds, while MDs' prioritized making triage of inflowing patients.

To summarise, ED nurses and nursing managers were largely consistent with their preferences. MDs' on the other hand, demonstrated some divergence as they ranked caring of a patient with respiratory insufficiency on the second place. Other sub-panels had not ranked this task among the top five. Whether *caring of a patient with a respiratory insufficiency* should be understood here as starting a CPAP- care according to the independent assessment of an ED nurse, can' t be decided with certainty. This might, however, be one interpretation for this result. On the other hand, pain management was not on MDs' highest priorities in this regard. MDs had raised consultation of a specialised MD independently as the fourth, and referral to an appropriate point of care as the fifth priority. These are tasks traditionally belonging merely to the scope of MDs' practice.

TABLE 6. The three sub-panels' perceptions of the five most important tasks requiring advanced clinical skills to be considered for transferring to the responsibility of ED nurses, frequencies and percentage shares among the sub-panel in question.

Sub-panel	ED nurses (n=167)	Frequency (percentage among the sub-panel)	Nursing managers (n=15)	Frequency (percentage among the sub-panel)	MDs (n=26)	Frequency (percentage among the sub-panel)
Priority	Task		Task		Task	
1.	Minor suturations	29 (17.4%)	Ordering of lab. tests and x-ray examinations	4 (26.7%)	Making triage of in-flowing patients	5 (19.2%)
2.	Ordering of lab. tests and x-ray examinations	26 (15.6%)	Caring of a lifeless patient according to protocol	3 (20%)	Caring of a patient with respiratory insufficiency	4 (15.4%)
3.	Pain management	20 (12%)	Minor suturations	2 (13.3%)	Ordering of lab. tests and x-ray examinations	3 (11.5%)
4.	Caring of a lifeless patient according to protocol	5 (3%)	Pain management	2 (13.3%)	Consulting a specialised MD independently	2 (7.7%)
5.	Consulting a specialised MD independently	4 (2.4%)	Referral to an appropriate point of care	2 (13.3%)	Referral to an appropriate point of care	2 (7.7%)
Missing		56		-		5

6.5.2 Redistribution of tasks – the future of designated clinical skills

The results of the III Delphi- round are grouped according to themes equal to the classification of the initial literature survey (chapter 2) with such a deviation that the theme *Caring and nursing role of an ED nurse* was not dealt with here. Thus, the themes were ED triage; Expanding the scope of ED nurses' practice; and Clinical competence and competence assessment.

Theme ED triage consisted of two statements (1 and 2). The results are presented in Tables seven and eight. The comments of the review panel during the IV Delphi- round are provided after each statement accordingly.

Theme: ED triage

An operational model of a triage-nurse in every shift was generally favoured. Only five members considered this as improbable, and two as undesirable. ED nurses were most critical in their assessments of the probability of realising this policy (**Table 7**).

TABLE 7. Frequency distribution of the responses of the sub-panels to statement 1: *"A triage-nurse working in each shift assesses every patient's need of care and makes sure that the necessary treatment will get started"*

	Will realise in 2020	Will not realise in 2020	Desirable	Undesirable
Sub-panel (n)				
- ED nurses (n=9)	5	3	6	1
- MDs (n=7)	6		6	1
- Central administration (n=10)	10		9	
- Researchers, teachers, bystanders (n=9)	7	2	8	
Sub-total	**28**	**5**	**29**	**2**
Missing	2		4	
Total	35		35	

Reasoning for these opinions was largely consistent in all sub-panels. At continuously growing EDs a system of co-ordination is essential. Congested EDs and the growth of patient volumes demands properly made triage. It was claimed that a nurse, who has been systematically trained for this, is economically and functionally the best alternative. This seems to be a sensible rationalisation.

Patient safety was one more line of reasoning that justifies this policy. Triage-based classification of urgency of care improves the outcomes for patients, it also helps in targeting care and the need of care providing that EDs will become more multidisciplinary. In addition

to MDs and RNs, there is a need of experts in the fields of substance abuse, social and welfare services and mental health care. A triage-nurse's work should be seen as wider assessment of patients' need of help, care and specialism.

This statement has partially been realised already, but could be even more systematic. Training in triage would bring with it a certain homogeneity in the assessment of patients. Reasoning could be found from the history, as well. A similar policy, or a close one, was said to work in the 1970's and would work nowadays providing that the nurses are trained properly.

In order to realise this statement, a re-evaluation of the whole education and training of RNs was mentioned to be desirable in order to achieve more practically competent nurses instead of theorists. There must be a leader with enough experience in this kind of action, and there is a call for further education and training: *"There is no reason to leave this excellent model unused in Finland – enough positive evidence does already exist elsewhere."*

A member of the ED nurses pointed out that an obstacle for a triage-nurse policy to become widely applied may turn out to be an anticipation that there will no longer be professionally skilled ED nurses in 2020. Along with better salaries elsewhere, the skilled ones will disappear to other tasks.

Comments of the review- panel
It was pointed out that ED nurses were most pessimistic in terms of the realisation of this policy, which, on the other hand, has already been realised regionally. Triage- nurses will probably not initiate all the necessary care by themselves, but will ensure that it will be started.

A consensus seemed to prevail in all sub-panels (**Table 8**), as only one member of the MDs' group considered statement two as improbable and undesirable. ED nurses pointed out that this protocol has been adopted for years, albeit not always officially. It was clearly wished that protocol-based policies be formulated: *"Clear protocols would clarify ED nurses' work and speed up the care; MDs order special examinations."*

Yet, one member of the MDs' group emphasised strongly that those protocols should not put aside either good, active communication between the triaging nurse and a MD on-call or a flexible, pre-emphasised, co-operation.

TABLE 8. Frequency distribution of the responses of the sub-panels to statement 2: *"Triage-nurses (or a nurse to whom a triage-nurse hands a patient over) start according to their assessment and/or following a certain protocol appropriate examinations (including lab. and most common native x-ray studies)"*

	Will realise in 2020	Will not realise in 2020	Desirable	Undesirable
Sub-panel (n)				
- ED nurses (n=9)	8		6	
- MDs actively involved in emergency medical care (n=7)	4	1	5	1
- Central administration (n=10)	10		9	
- Researchers, teachers, bystanders (n=9)	9		8	
Sub-total	**31**	**1**	**28**	**1**
Missing	3		6	
Total	35		35	

The group of researchers etc. pointed out that the action should, however, not be based solely on following guidelines; well-reasoned clinical pathways and evidence-based recommendations for care should rather be discussed, which are followed by the whole multidisciplinary team understanding the reasoning behind them.

Comments of the review- panel

The obvious consensus was considered positive. Overemphasising the use of protocols was mentioned to carry the risk that the theoretical background is not strong enough to enable application.

Theme: Expanding the scope of ED nurses' practice

This theme consisted of five statements (3 – 7), and the results are presented in tables 9 – 13. A notable unanimity was obvious within all four sub-panels, as only one member of the emergency MDs' group considered statement three as undesirable and one third of the group as not realising by 2020 (**Table 9**).

TABLE 9. Frequency distribution of the responses of the sub-panels to statement 3: *"ED nurses are responsible for the pain medication with certain patients (haemodynamically stable, fully alert adult patients) at the initial stage of the ED care following giving protocols including certain intravenous drugs."*

	Will realise in 2020	Will not realise in 2020	Desirable	Undesirable
Sub-panel (n)				
- ED nurses (n=9)	6	2	6	
- MDs (n=7)	4	2	5	1
- Central administration (n=10)	8	2	8	
- Researchers, teachers, bystanders (n=9)	8		9	
Sub-total	**26**	**6**	**28**	**1**
Missing	3		6	
Total	35		35	

ED nurses stated that this policy is already in common use. Furthermore, protocol-based treatment seems to be increasing all the time, delay in the commencement of treatment is being shortened, and MDs are focusing on the care of the most severely ill/injured patients. However, medication should be implemented only by nurses who have passed appropriate tests. There seems to be a clear need to secure the commencement of help. Pain medication was mentioned to nowadays be unsatisfactory. Pain is often caused e.g. during patients transfer and lifting, where it is not always possible and feasible to obtain an MD' s order for adequate analgesia.

One member of the MDs' group presented interesting comments in favour of this statement: *"We are already travelling this road quite far, but training is mostly orientated towards this at each workplace. Nationwide training and consensus-based instructions are still lacking." "This kind of preparedness should be obtained during structured vocational training, not by some kind of recipes from different cookery-books outlined by different hospitals."*

Members of central administration and researchers etc. were largely unanimous concerning this statement. New ways to operate have to be found if the amount of MDs is diminishing. According to the redistribution of tasks between MDs and nurses, this was considered to be possible provided that ED nurses can receive enough education, training and experience for

assessing the situation and making a decision concerning the patient's need of pain medication. However, vocational training will offer a safer than present day basis for the right treatment decisions, which are not solely protocol-based. Experiences from the pre-hospital surroundings were referred to: *"Modern treatment of pain actually demands us to begin the analgesia at the initial phase of care. Why should there in the nursing process be a phase when a nurse acts differently than for example in the pre-hospital phase or in other units of the same hospital?"*

On the other hand it was stated by ED nurses themselves that current nursing education does not provide nurses with sufficient training and skills in the assessment of the clinical condition of a patient so that nurses, based on their own assessment, could give medical treatment for patients. An MD will order medication also in the future. Intravenous medication was considered to be so demanding and risky that its prescribing by nurses will mainly not be realised. In terms of other medication this may be possible.

Comments of the review- panel

Experiences from the pre-hospital phase of care and the training of nurse-paramedics were referred to when emphasising the urgent need to develop nurses' training in order to enable more independent action in the field of medical treatment. The panel wondered if the hesitation on this issue might be due to the lack of experience in obeying a policy outlined in the statement.

ED nurses seemed to be proportionally most critical in terms of the realisation of statement four, as half of them considered this as improbable, albeit all of them as desirable (**Table 10**). Nurses were thought to be able to take care of some of the patients by themselves, and some will be taken care of together with a MD. This was considered a reasonable use of resources and professional skills also by the group from central administration.

The group of researchers pointed out that this policy might make the action of ED and patient instructing more effective. Currently, patients may be discharged without appropriate instructing, because RNs are necessarily not involved in the discharging phase of patients.

TABLE 10. Frequency distribution of the responses of the sub-panels to statement 4: *"A triage-nurse guides certain ED patients to a nurse reception, where a specially trained nurse is responsible for the assessment and care of that patient, consulting, if necessary, an MD. The nurse is also responsible for discharging the patient with appropriate instructions for further care or, when necessary, transferring the patient to the reception of an MD"*

	Will realise in 2020	Will not realise in 2020	Desirable	Undesirable
Sub-panel (n)				
- ED nurses (n=9)	3	3	8	
- MDs (n=7)	4	2	5	1
- Central administration (n=10)	8	1	9	1
- Researchers, teachers, bystanders (n=9)	7	1	8	
Sub-total	**22**	**7**	**30**	**2**
Missing	6		3	
Total	35		35	

ED nurses also raised a career issue to support this policy, as this kind of working model that is implemented for example in the USA, surely would have positive impacts on the work load of EDs and the rationalising of action. This would additionally bring an interesting possibility of further education and training for RNs. All this, however, only if taking and sharing responsibilities are understood correctly, as one member of the MDs group reminded.

Several options were elicited both by the group of researchers etc., and ED nurses: *"I regard as desirable that a triage-nurse would also have other options than a nurse reception, at their disposal; we also need receptions of a mental health care professional, social worker and a professional of substance abuse care. As experts they would be responsible for the immediate and further care in their own field of speciality."*

However, the whole rationale behind this statement was disputed by a member of (central) administration: *"This kind of patients in an ED means unsuccessful patient guidance, they belong to primary care."* Officially agreed boundaries for ED care were also reminded to be

necessary, as *"an ED is not a full-service station; it is supposed to be dedicated to the care of acutely severely ill/ injured"*.

Comments of the review- panel

The comment related to the availability of a mental health care professional, social worker, and a professional of substance abuse care was considered excellent and, above all, necessary. On the other hand, nurses were cautious in trusting to totally independent nurse-led units within EDs, even they are widely an everyday routine. The basic vocational training probably does not provide sufficient competence for this, but training programmes for advanced competencies can be constructed accordingly. The emergency MDs' representative expressed a perception that *"...there seems to prevail a certain level of pessimism in terms of possibilities to construct the theoretical knowledge base more strongly in the future either"*.

The groups consisting of ED nurses and MDs were more critical than others in terms of the realisation of statement five (**Table 11**). All panellists in favour of this statement, regardless of the group they represented, emphasised the need to clearly intensify nurses' training both in natural sciences and in skills of patient assessment. They both also serve as essential conditions for pharmaceutical care.

Other arguments used in favour of this statement were approximately the same in all sub-panels. A restricted right for prescribing, for example, with clear bacterial infections (e.g. UTI, streptococcal laryngitis) and contraceptives, will be probable, and MDs time could then be dedicated to the care of the critically ill. Some of the antibiotics and contraceptives (pills, IUDs) are already prescribed by RNs. This has already been proposed by trade unions, and in the working group of Ministry of Education this issue has been discussed in a positive atmosphere.

Members of the central administration pointed out that the legislation needs to be remodelled if this is to be realised. It was also doubted if the education and training of nurses would become so much more effective in future that nurses would be delegated the right to make a diagnosis. It is in any case a prerequisite for prescribing; this requires a consensus between trade unions and reformation of legislation. Some panellists from the ED nurses' group did not perceive this as part of nursing and caring work at all: *"Somehow I can't see the renewing of prescriptions as part of a nurse's professional profile, at least at this moment it is a strange idea."*

TABLE 11. Frequency distribution of the responses of the sub-panels to statement 5:
"As part of the above mentioned working model (nurse reception) an RN has a restricted right to prescribe drugs for patients."

	Will realise in 2020	Will not realise in 2020	Desirable	Undesirable
Sub-panel (n)				
- ED nurses (n=9)	2	5	6	2
- MDs (n=7)	3	3	5	1
(Central) administration (n=10)	7	2	6	1
- Researchers, teachers, bystanders (n=9)	7	1	9	
Sub-total	**19**	**11**	**26**	**4**
Missing	5		5	
Total	35		35	

Comments of the review- panel

An apparent division between ED nurses and MDs was expected, but more comments were anticipated from other sub-panels. The policy is already adopted regionally, with various methods of implementation.

All but one panellist regarded statement six as desirable, and two did not believe in its realisation (**Table 12**). Throughout the whole panel this policy was considered wise and economical, speeding up the care as well as showing indications of sensible redistribution of work.

Researchers, teachers and bystanders presented numerous arguments in favour of this statement. The growing demand for ED services was mentioned as forcing us to reform the roles and reorganise the work. Public health nurses already do this. This could be implemented as part of multidisciplinary teamwork. However, this should not be restricted merely to writing certifications, attention should also be paid to prevention and discovering the basic problems.

TABLE 12. Frequency distribution of the responses of the sub-panels to statement 6: *"As part of the above mentioned working model an RN has a restricted right to write certifications for sick-leave and other certifications for patients."*

	Will realise in 2020	Will not realise in 2020	Desirable	Undesirable
Sub-panel (n)				
- ED nurses (n=9)	7	1	7	
- MDs (n=7)	5	1	5	1
- (Central) administration (n=10)	10		10	
- Researchers, teachers, bystanders (n=9)	9		8	
Sub-total	**31**	**2**	**30**	**1**
Missing	2		4	
Total	35		35	

One comment from the MDs' group was: *"The legislation should not prevent us from doing this."*

Comments of the review- panel

These comments were regarded a sensible and desirable. This policy is already obeyed by public health and occupational health nurses. The implementation of such a policy would significantly relieve the burden on MDs on-call, especially in the future. The sub-panel of researchers, teachers and bystanders emphasised the importance of prevention, and early intervention when problems have been detected, which should be self-evident in a real professional's work.

The item, presented in statement seven, was widely agreed upon. Neither did arguments differ according to each sub-group (**Table 13**). This was mentioned to have been realised already in various places, especially abroad, and is expected to become more common in Finland as well. It was considered quite realistic provided that training is offered and evidence of mastery has been shown: *"They can act like this in the peace-keeping forces of UN." "How is this supposed to differ from e.g. plastering a non-dislocate fracture?"* Caring for minor wounds and contusions is already a part of the ED nurses' role, mastering the suturations would take only little further training and education in instructing the patient in aftercare.

TABLE 13. Frequency distribution of the responses of the sub-panels to statement 7:
"An ED nurse takes independent care of patients with minor wounds needing suturation."

	Will realise in 2020	Will not realise in 2020	Desirable	Undesirable
Sub-panel (n)				
- ED nurses (n=9)	5	2	5	2
- MDs (n=7)	3	3	4	1
- (Central) administration (n=10)	10		8	
- Researchers, teachers, bystanders (n=9)	7	1	7	1
Sub-total	**25**	**6**	**24**	**4**
Missing	4		7	
Total	35		35	

A member of the MDs' group pointed out that an ED nurse meets patients with wounds much more often than does an MD. Members of central administration considered it noteworthy that redistribution of work, as outlined in this statement, would ease the burden of work of MDs on-call as well as shorten waiting times. Researchers etc. reminded that midwives are already suturing wounds. This used to be an everyday routine, as 30 years ago it was commonly operated like this.

Two members of the ED nurses' group opposed this statement, which was considered unnecessary in specialised medical care. In peripheral primary care this would be sensible, but in hospitals there are enough MDs. Furthermore, an expression of concern was evident in the comment of this group: *"The actual caring work is left undone if our scope of practice is expanded continuously."*

Comments of the review- panel

MDs have reacted immediately when their traditional domains turfs are interfered in, which is not unexpected. Nurses follow, as always. It was mentioned that even though MDs would not oppose the expansion of the scope of nurses' practice, the nurses will do this themselves. This may be due to fear of additional responsibilities, as well as lack of trust by nurses in their own skills. Moving to this kind of policy naturally requires appropriate training, but experiences from abroad can easily be found.

Theme: Clinical competence and competence assessment

This theme consisted of six statements (8 – 13). The results are presented in tables 14 – 19. Statement eight divided the experts' perceptions in all sub-panels (**Table 14**). It was speculated that the statement was, to some extent, blurred, as it was mentioned that the nurse *takes* an arterial blood-gas sample. It was not, however, specified whether the sample is drawn from an existing arterial line, or actually punctured from an artery. These are two totally different matters and seemed to cause some confusion among the respondents. When interpreting the result of a blood-gas analysis taken by a single puncture the interpreter must be aware of the possibility of venous puncture and be able to distinguish such a situation from the result of the sample. This, on the other hand, is not always self-evident. When drawing the sample from an existing arterial line this is not an issue.

TABLE 14. Frequency distribution of the responses of the sub-panels to statement 8:
"ED nurses assess the clinical condition of an ED patient (as part of other assessing measures) by taking an arterial blood-gas sample and interpreting the result by themselves"

	Will realise in 2020	Will not realise in 2020	Desirable	Undesirable
Sub-panel (n)				
- ED nurses (n=9)	3	4	3	2
- MDs (n=7)	1	4	2	4
- Central administration (n=10)	4	6	3	5
- Researchers, teachers, bystanders (n=9)	3	5	6	2
Sub-total	**11**	**19**	**14**	**13**
Missing	5		8	
Total	35		35	

ED nurses commented that the skill to interpret these results should be an essential part of an ED nurse's competence. Furthermore, it was stated that the respirators are already adjusted according to these results, but this seems to be rather an unofficial than official policy.

The group of MDs did not consider this statement as either probable or desirable, but reasoning was sparse. The technical procedure of puncturing an artery was not commented on

itself, but the interpretation was considered to be a demanding task even for an experienced MD.

The sub-panel of central administration considered the interpretation to be manageable, but the technical procedure requiring more medical knowledge and experience than nurses have, as well as being a complication-prone procedure. Thus it might be better left to MDs.

Researchers, teachers and bystanders had mixed opinions. On the other hand this was mentioned to be everyday routine within intensive care and to provide one dimension of deepening the professional competence of ED nurses. This group proposed this procedure to be delegated to some specified ED nurses, whose competence in this regard would enhance, as the annual number of these procedures might be substantial. Then again, this procedure itself was thought to require such a high level of knowledge in anatomy and physiology as cannot be obtained during nurses' training.

Comments of the review- panel
Skills to interpret the results of blood-gas analyses were emphasised due to the view of the future as being such that patients have to be treated applying more and more invasive methods. If the emergency health care services are centralised strongly, the importance of these skills will grow due to the impending out-flow problems of patients.

The emergency MDs' representative mentioned that *"Actually taking a specimen for blood-gas analysis by puncturing an artery is hardly a more demanding procedure than cannulating a peripherial vein, but the interpretation of the test result might be too complicated"*.

An undisputed consensus prevailed with statement 9, as nobody objected to the probability or desirability of this statement (**Table 15**). This seems to be largely an everyday routine. However, it was clearly desired there to be written protocols for starting infusions with different groups of patients. Furthermore, there was no ambiguity of the panel's opinion in terms of the fact that this competence should be obtained during basic vocational nursing training

A particular notion was offered by a member of the group of researchers, teachers and bystanders emphasising that a cavalier attitude cannot be tolerated here: *"Adhering to and knowing the protocol does not guarantee the safety of care; the grounds, aims, indications,*

contra-indications and possible complications of fluid therapy must be understood and recognised from the monitoring parameters."

TABLE 15. Frequency distribution of the responses of the sub-panels to statement 9: *"ED nurses open, according to their own consideration, an i.v.-line to a superficial vein of a patient's upper or lower limb for intravenous medication and start, when necessary, a fluid therapy according to an existing protocol."*

	Will realise in 2020	Will not realise in 2020	Desirable	Undesirable
Sub-panel (n)				
- ED nurses (n=9)	8		6	
- MDs (n=7)	6		6	
- Central administration (n=10)	10		7	
- Researchers, teachers, bystanders (n=9)	9		8	
Sub-total	**33**	**0**	**27**	**0**
Missing	2		8	
Total	35		35	

Comments of the review- panel

This policy seems to be so widely applied that comments were sparse.

Apart from the use of intubation and according to one member of the MDs' group also alternative airway methods, the realisation of statement ten was considered both probable and desirable (**Table 16**). It was generally regarded as necessary that ED nurses would be able to initiate the care of a lifeless patient as outlined in this statement with the aforementioned comments regarding airway methods. Speeding-up the care is related to better outcomes and can be mastered largely as protocol-based. These skills should also be obtained during the basic vocational training of nurses, but this was mentioned not to be the case currently: *"This should already have been realised, but current level of education and training does not make this possible, hopefully things will have changed in 2020."*It was also asked why should this should not be possible in-hospital, as in the pre-hospital setting this is a routine way of action, even at basic-level.

TABLE 16. Frequency distribution of the responses of the sub-panels to statement 10: "*ED nurses are capable of starting the care of a lifeless patient according to evidence-based protocols including defibrillation, cardiac compressions and respiratory care using various methods (bag-calve mask, intubation and its alternative methods e.g. laryngeal tube, laryngeal mask).*"

	Will realise in 2020	Will not realise in 2020	Desirable	Undesirable
Sub-panel (n)				
- ED nurses (n=9)	7	1	5	2
- MDs (n=7)	3	3	6	
- Central administration (n=10)	9		8	
- Researchers, teachers, bystanders (n=9)	7	2	7	1
Sub-total	**26**	**6**	**26**	**3**
Missing	3		6	
Total	35		35	

Objections to the desirability of this statement focused merely on intubation, and it was stated that "*…if there is an MD available in that unit, intubation is not a nurse's job. It takes a long education and training. Intubation is easy, if everything goes ok, but what if complications occur? It is hard to imagine that all nurses would meet enough patients to guarantee a safe intubation*." On the other hand, one important aspect more was elicited by a member of the researchers', teachers' and bystanders' group: "*If the mastering of acute nursing care becomes too much 'procedure-focused' in 2020, will the special competence in nursing care disappear from EDs?*"

Comments of the review- panel

MDs were mentioned to be the doubtful sub-panel, but they also considered this as desirable. Intubation should be replaced by alternative airway methods, as has already occurred largely in the pre-hospital settings. Every nurse should be taught the skills required for the support of vital functions. This is not the case currently, however. Strong arguments illustrating various aspects of the policy of this statement was expressed by the MDs' representative, as follows: *"Resuscitations occur quite seldom nowadays in the ED"*, and *"ED nurses should definitely*

master the issues included in the statement. An MD should be allowed to concentrate on issues belonging solely to MDs. But currently, when there comes an in-hospital cardiac arrest situation, my primary concern is to look after that nobody does anything foolish". From the researcher' s point of view it seems reasonable to add that this last quotation did not seem to reflect in the least an undervaluation towards nurses themselves, but a genuine expression of concern originating from clinical experience.

Mixed opinions could be detected around statement 11. The arguments divided in terms of the probability of this statement, but a more unanimous perception of its desirability was evident. The group of researchers, teachers and bystanders had slightly the most positive opinions, as all except one member considered this as desirable (**Table 17**).

ED nurses claimed that this has already realised because of inadequate (continuously changing) junior MDs in the front line. Experiences from pre-hospital surroundings were referred to, as in the pre-hospital settings this kind of policy has already been adopted even at basic level for years: *"Why not in-hospital?"* Progress towards the outlining of the statement was considered probable and desirable, as *"there will be an increase in the amounts of acute nursing care education and training, so nursing personnel adopt a more independent way of thinking and caring." "When EDs are severely congested, nurses should be able to assess the clinical condition of patients and initiate the care more independently in order to avoid unnecessary delays in treatment."*

Resistance was reasoned by reference to nurses' education and training, which was said not to allow this. Assessing the clinical condition of a patient is not sufficiently taught for nurses. Those working in the EDs with paramedical training seem to have better starting points for assessing patient's clinical condition and commencing the care. One member of the MDs' group emphasised the issue of co-operation and mutual guidelines with MDs' on-call.

Members of central administration considered that competencies, required for this future to be possible, belong to the core vocational competencies, which are then proceeded from. Educational issues were emphasised as well as the orientation of newly recruited personnel. The preparedness outlined in this statement was considered excessive: *"Nurses can't be delegated MD' s entitlement to set a diagnosis…, which is a precondition for medical care." "It can't even be set as a target that nurses would master this reliably with every patient."*

TABLE 17. Frequency distribution of the responses of the sub-panels to statement 11: *"ED nurses are capable of assessing the clinical condition of a patient so well that they can reliably recognise the needs of a patient and independently start the necessary treatment including care of the disturbances of vital functions before the MD on duty arrives."*

	Will realise in 2020	Will not realise in 2020	Desirable	Undesirable
Sub-panel (n)				
- ED nurses (n=9)	5	3	6	1
- MDs (n=7)	2	4	4	1
- Central administration (n=10)	7	3	6	3
- Researchers, teachers, bystanders (n=9)	6	3	7	1
Sub-total	**20**	**13**	**23**	**6**
Missing	2		6	
Total	35		35	

The group of researchers, teachers and bystanders regarded this as desirable, but significant reforms of the training towards more clinical orientation is required, as well as reversal of attitudes: *"ED nurses should understand the immediate message of the monitoring parameters, to recognise impending arrhythmias and changes and to draw the conclusions as well as make a working hypothesis on the grounds of patients' symptoms, and to give the immediate care based on the work-hypothesis and inform the MD on duty in time. Priority must be put on securing ventilation and circulation."*

Obstacles for the realisation were also mentioned: "*Prior to reorganising the work, a serious consideration should take place in terms of what is the special competence of each profession in the multidisciplinary working groups. It is sensible to cut off overlapping work and make the action more effective. Realising this takes profound medical studies. Does this belong to the professional competence of a nurse, or will there be a new kind of profession formed for EDs by 2020?*"

Comments of the review- panel

This statement moves on to the traditional domain of MDs, which is reflected in a division of the responses. Once again, the experiences gained from the pre-hospital surroundings lend

support to a conclusion that this can be set as an achievable goal. Only the majority of the MDs sub-panel had anticipated this as not being realised by 2020. A clear majority of all respondents had considered this as desirable. *"A working hypothesis has to be settled, the main issue is not setting the definite diagnosis at the initial phase of ED care"*, was the comment of the MDs' representative.

Opinions were divided evenly in all sub-panels in terms of statement 12 (**Table 18**), albeit that resistance both to the probability and desirability was prominent. According to the ED nurses' group CPAP-care, as part of the methods of oxygen therapy and respiratory care, should clearly be included in the scope of a nurse's practice. They reminded that pre-hospital EMS has for years taken care of starting this treatment, even at the basic level. The next quotation serves as a summary of ED nurses reasoning in favour of this statement: *"Nurses should be able to make a distinction between different states of diseases with patients presenting with respiratory distress and to independently start adequate oxygen therapy including CPAP-care."*

As obstacles preventing this policy from realising ED nurses mentioned that in minor EDs this procedure may bay so uncommon that the step to start the care may turn out to be too high. A comment from the MDs' group might serve as a response to the aforementioned concern: *"The step to start CPAP- care should not be too high."*

Central administration considered that this policy requires a significant amount of additional training in order to be able to be realised. Two arguments, which emphasised the necessity of being an MD when making the working hypothesis of pulmonary oedema of cardiac origin and starting the CPAP- care, were presented. However, it was not specified what is the exact reason for this perception: *"As far as I understand it this requires the special competence of MDs." "Cardiac pulmonary oedema is a life-threatening condition the diagnosis, treatment and follow-up of which belongs to an MD."*

Researchers, teachers and bystanders were rather positive towards this policy in their statements. According to them, CPAP-care devices are part of the standard care at hospitals and pre-hospital medical care, so the transfer of the initiation of CPAP-care to adequately trained nurses can easily be established. Furthermore, this was mentioned to be a simple procedure from its principles and to carry out, clear criteria can easily be defined for when to start and what are the contra-indications. This increases the flexibility and organisation of the

work, and enables a faster help response for patients. With clear cardiac pulmonary oedema this was assessed to be sensible, and the benefits of CPAP-care have been acknowledged. However, caution has to be exercised, and this policy requires a specially trained nurse who can with certainty distinguish a pulmonary oedema of cardiac origin.

TABLE 18. Frequency distribution of the responses of the sub-panels to statement 12: *"ED nurses start, based on their clinical assessment, a CPAP- care along with other necessary measures as part of the treatment protocol for patients presenting with cardiac pulmonary oedema."*

	Will realise in 2020	Will not realise in 2020	Desirable	Undesirable
Sub-panel (n)				
- ED nurses (n=9)	5	2	4	1
- MDs (n=7)	3	3	4	2
- Central administration (n=10)	6	3	5	3
- Researchers, teachers, bystanders (n=9)	6	2	5	2
Sub-total	**20**	**10**	**18**	**8**
Missing	5		9	
Total	35		35	

Comments of the review- panel

The resistance towards the nurse-initiated CPAP- treatment was considered surprising, as this method has been applied in the pre-hospital surroundings for years, even at basic level. This does not, however, justify a cavalier attitude towards the known risks related to CPAP- care. Still, this method of care was anticipated to belong to the repertoire of ED nurses in the future. Cognitive skills in terms of pathophysiology have to be mastered thoroughly due to aforementioned reasons: *"This is wise and low-risk. If the patient deteriorates during CPAP-care, it can always be discontinued".*

Opinions varied through the sub-panels in terms of statement 13. MDs were more pessimistic than others in terms of the realisation of this statement. However, three members of this group considered this policy as desirable, while two of them thought it undesirable (**Table 19**).

The final decision concerning the treatment options was generally left to an MD. On the other hand, it was also anticipated that along with the growth of the nursing profession a nurse will in a responsible way start treatments and examinations and recognise an AMI, after which an MD will make the decisions concerning the outlines of the care.

A member from ED nurses' group commented, as follows: "*I considered it very important that nurses are capable of interpreting ECG findings and reporting them to an MD, because nurses usually are the first to see the patient's ECG. It would be possible to shorten the delay in initiating the care, and nurses should form a perception of the patient's clinical condition (does the patient's ECG show evidence of myocardial ischemia or acute AMI?).*"

The MDs' group was not very enthusiastic about this statement, as the clinical presentation of AMI and interpretation of ECG findings may turn out to be a stumbling block, even for a specialist of internal medicine: "*This is not merely a matter of negotiating with an MD. I think an MD makes a decision and carries the responsibility, too. A triage nurse prioritises this patient and an MD examines the patient immediately and makes a decision without delay.*"

The members of central administration also demonstrated reluctance to accept this policy. "*This is a matter for medical professionals*." "*A nurse is not entitled to make a diagnosis*." "*A cardiologist must make the decision, a nurse can make an initial assessment, no more. A paramedic or a nurse can make preliminary screening and rule out patients that are by no way suitable for PTCA*."

Statement 13 was considered to suffer from vagueness, which is illustrated by the next quotation: "*This has already realised in pre-hospital care. This statement is somehow unclear, an MD makes decisions concerning that care, a nurse produces the information and findings on which the decision is based. But you cannot actually negotiate for something that you cannot decide by yourself.*"

Finally, researchers, teachers and bystanders reminded that this policy is already adopted, at least to some extent, in pre-hospital EMS. Adequate clinical pathways and protocols aid in applying issues mentioned in this statement. This would also speed-up the care, but takes a substantial reform of nurses' training and attitudes. On the other hand, members of this group also pointed out that MDs probably will make the final decisions in this kind of medical care.

TABLE 19. Frequency distribution of the responses of the sub-panels to statement 13: *"An ED nurse recognises patient's acute myocardial infarction based on clinical symptoms and ECG findings and negotiates with an MD if a PTCA or a thrombolytic therapy should be started."*

	Will realise in 2020	Will not realise in 2020	Desirable	Undesirable
Sub-panel (n)				
- ED nurses (n=9)	5	2	6	2
- MDs (n=7)	1	5	3	2
- Central administration (n=10)	5	4	6	3
- Researchers, teachers, bystanders (n=9)	5	3	6	1
Sub-total	**16**	**14**	**21**	**8**
Missing	5		6	
Total	35		35	

Comments of the review- panel

Steps towards a more active role for ED nurses in this clinically important issue are desirable. However, the authority of a nurse will be delimited to the level of paramedics: a thorough examination, a reliable anamnesis, setting a working hypothesis, obtaining an ECG, and discussion with an MD on-call about the appropriate interventions needed. Even a policy like this might speed-up the initiation of definitive care: *"Recognition of a basic AMI is clear, it has to be recognised by ED nurses"*.

6.6 Summary of the results

The presentation of the results of this four-rounded Delphi study is completed by a summary of the findings (Figure 12). The researcher scrutinized the results meticulously, and a cruel selection was executed. Ultimately, merely results having paramount importance in proportion to research questions, were included in the conclusive summary, which proceeds according to research questions. When appraising the findings, concerning the level of clinical skills of ED nurses currently, it should be noticed that a **sign** + means that this item was considered to be mastered by ED nurses currently, while a **sign** – correspondingly means that

the item is not mastered by them. Furthermore, the sub-panel(s) mentioned after the **signs** + and – have had such a perception of the item.

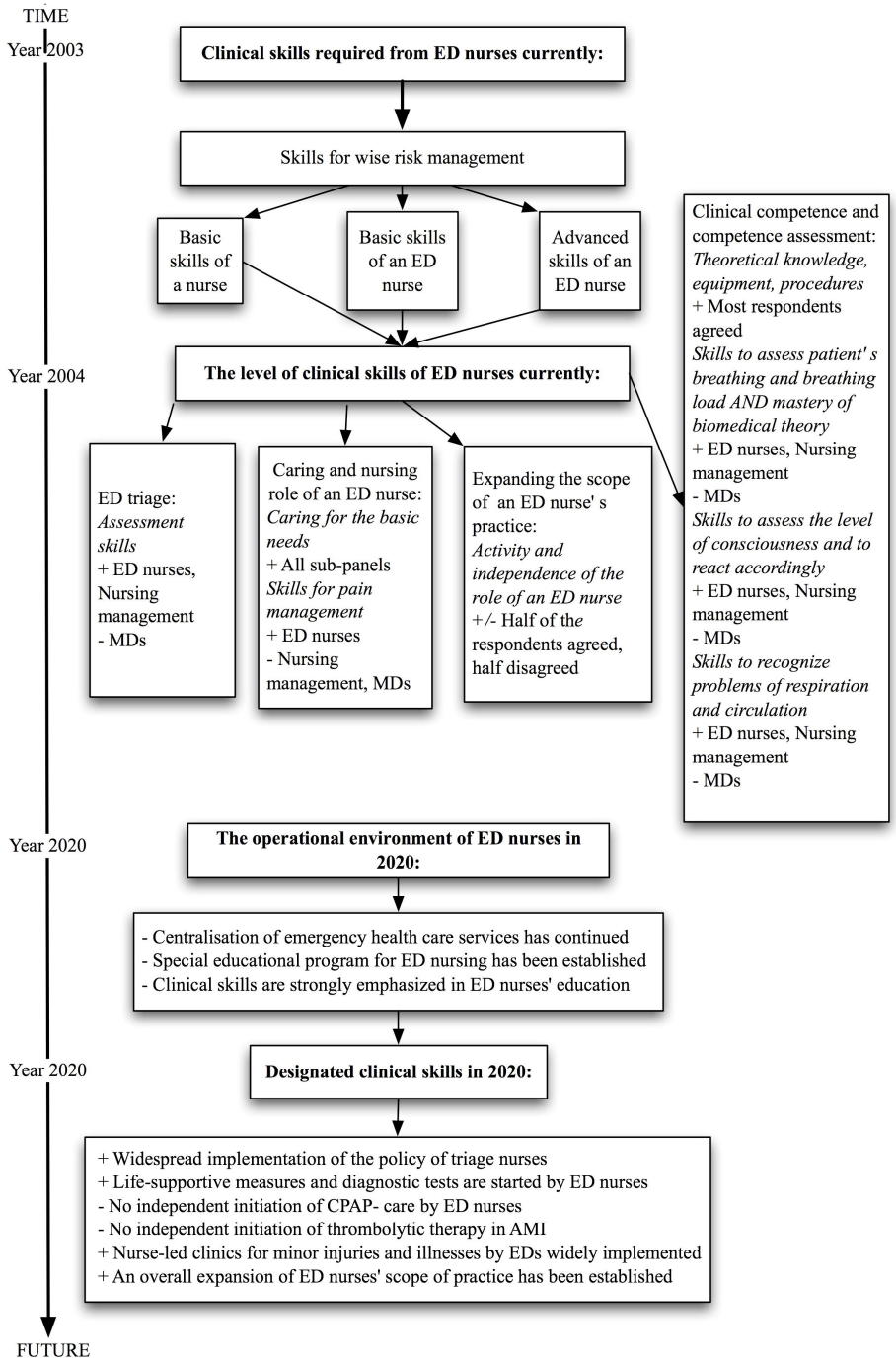

FIGURE 12. Summary of the results.

7 Discussion

The purpose of the study was to reveal and describe the current, and anticipate the future operational and educational requirements with special reference ED nurses' clinical skills. On the basis of the preceding and some background data, three alternative scenarios for future ED nursing's scope of practice were outlined. Moreover, experts' perceptions were gathered in order to anticipate the probable and desirable future(s) of this domain of clinical nursing, i.e. what will the operational environment of future ED nurses be like, and what kind of clinical skills will be required from an ED nurse in 2020. In addition, the reliability, validity and fulfilment of the success criteria of the study will be evaluated. The discussion follows mainly the outlining offered by May (1993).

7.1 Main findings

The clinical skills required from ED nurses currently

The core of ED nurses' clinical skills were related to ability to control the clinical situation of each patient, and the whole situation in the ED at any given moment. These skills were summarised in Figure 11. This is a fundamental finding, which is in accord with the clinical experience of the researcher, and thus not unexpected. On the other hand, it can be called surprising that the concept of 'risk management' related to ED nurses' work emerged so obviously among the data.

Three main components could be detected, namely: 'Basic skills of a nurse', 'Basic skills of an ED nurse', and 'Advanced skills of an ED nurse'. These components seemed to be related to ED nurses' ability to master such fundamentals that serve as the basis of all clinical nursing. Without a sufficient mastery of these, professional clinical nursing is hardly possible. These findings are not surprising or even new to a clinical care worker. However, the evident connection of mastery of practical nursing ethics, human relations skills, and the more technical side of a nurse's attributes may have not become highlighted in a comparable way among domestic research findings related to clinical nursing. Yet, the findings replicate the ideas and research outcomes of McLaughlin (1995), Baldursdottir and Jonsdottir (2002), Schriver et al. (2003), Ebright et al. (2003), Hallgrimsdottir (2004), Kihlgren et al. (2005), and Shattel et al. (2005).

The requirements set to cognitive skills consisted of demanding level of theoretical knowledge of the natural sciences. A thorough comprehension of pathophysiologic mechanisms behind acute illness and injury, as well as nursing science, emerged clearly. These findings can hardly be claimed to be surprising. The strong emphasis that was placed on mastery of the natural sciences replicates a perception, not uncommon among those responsible for orientation of newly recruited nurses, according to which the mastery of anatomy, physiology, pathophysiological phenomena and pharmacology varies excessively and cannot as a general rule be called sufficient. The findings related to nurses' knowledge are consistent with those presented by Bucknall and Thomas (1997). All in all, these findings seemed to be congruent with the background philosophy of Wiedenbach (Sitzman and Eichelberger 2004).

Patient safety issues were related to the reliability of the continuum of the care; the whole chain of care should be understood. The delivering sources as well as those receiving the patients transferred from ED ought to be known well enough for fluent mutual co-operation. This is no news for clinical nursing care workers, but highlights the importance of Tanner's (2006) findings concerning the importance of understanding the context where decisions are made. It is not an infrequent situation that pre-hospital medical care providers are criticised when they enter the ED with a patient. The same goes respectively to a situation where an ED patient is transferred to an ICU. Mutual understanding of the context where patient care and decision-making has occurred might relieve this phenomenon, sometimes called 'the principle of inquisition'.

Ability to recognise the 'pattern of a seriously ill and/or injured patient' is a characteristic that takes significant level amount of experience and tacit knowledge, and cannot be fully expected from newly qualified nurses. This skill was related to ED nurses' ability to anticipate the clinical course of patients, recognise a high-risk patient among others, and to be able to make a distinction between normal, abnormal, and seriously abnormal findings. This should all be mastered without the use of devices. Skills to detect signs and symptoms of patients, to process what is detected, to make independent decisions, and to respond adequately and actively are the cornerstones of the skills of an advanced level ED nurse. These findings are in accordance with previous studies reported by Coles (2002), Ebright et al. (2003), Tanner (2006), and Lasater (2007).

The quality of clinical skills of ED nurses currently

The original intention was to compare the perceptions of the three sub-panels representing ED nurses, nursing managers and MDs. This was the only research question were the perceptions of the respondents seemed to be tightly related to the professional background of the respondent as a group. One of the most important and clinically relevant finding of this study was the observation that despite patients' pain being recognised, pain management was inadequate according to nursing managers' and MDs'. ED nurses themselves did not consider this item as a problem, which might possibly reflect such a perception that it is MDs' duty to prescribe medication, nurses obey their orders with this respect. At the same time, this finding might also indicate some kind of exhaustion or frustration to the prevailing situation, where ED nurses are obliged to repeatedly ask for pain medication for their patients knowing that, for example, in the pre-hospital settings their colleagues are entitled to pain management according to standing orders and protocols. In other words the paramedical personnel, especially nurse-paramedics, are executing different kind of autonomy in the pre-hospital settings.

Yet, this kind of situation, where the main problem obviously is not recognition of pain, but its adequate management, might be more comforting than such a situation where pain would not be recognised at all. Inadequate pain management can be scrutinised as a moral issue, and at least then this issue turns out to be a major problem. These findings accord with those presented by McCaffery (2000), and Tanner (2006). When aspiring towards more adequate pain management, moral issues might be an asset worth bringing to nurses' education as a manifestation of practical ethics.

The unanimous findings of Hilden (1999), Meretoja (2003) and Säämänen (2004) were partially replicated in this study, as MDs did not consider ED nurses' theoretical knowledge sufficient, especially in terms of mastery of biomedical theory. When considered more closely, it was revealed that more than two thirds of MDs' sub-panel did not believe in the quality of ED nurses mastery of biomedical theory. This finding has clinical relevance, as reliable patient assessment is hardly possible without adequate theoretical knowledge. Then, again, ED nurses and nursing managers were clearly more optimistic with this regard. This discrepancy is concern-inducing, as improving the prevailing, according to MDs, situation, most certainly takes a large consensus in order to get nurses' curriculum under surveillance. Some reserve has to be executed, though, when drawing conclusions from these results.

The findings indicated an alarming discrepancy between the perceptions of ED nurses, nursing managers and MDs in terms of ED nurses' skills to assess vital functions and to react adequately when problems are detected. The disagreement was systemic, so that with all the skills related to assessment of vital functions and reacting adequately, MDs did not believe in the quality of ED nurses' skills. For the part of MDs' perceptions, the findings were nonetheless in concordance with those presented by Säämänen (2004), even though his findings were strictly related to resuscitation skills. These were fundamental findings and deserve to be scrutinised carefully.

Majority of the MDs' sub-panel were anaesthesiologists with active involvement in pre-hospital emergency medical care. The role of paramedical personnel in the pre-hospital settings tends to be more independent and to some extent also more inclined to emphasize the mastery of the skills needed for reliable assessment of acutely ill and injured patients' vital functions and to react to their disturbances. It might be that the highest activity of paramedical personnel is focused on assessing and supporting patients' vital functions, while ED nurses perhaps tend to have a more holistic approach to their patients. This speculation does not do justice for paramedical personnel, and neither does it at all mean that ED nurses would not be active. After all, the activity may be more related to taking care of patients' basic needs including social support, which, on the other hand, most certainly remains to be in the core of nursing. This was also confirmed by the sub-panels' responses. An unsolved issue remains to be how could these various elements of ED nurses' scope of practice possibly be united. As the aging of the population exceeds, this question will not be less valid than it seems to be nowadays.

This scientific study of clinical nursing aimed at obtaining experts' perceptions of the clinical skills needed in ED nursing in the long-range future. Domestic pilots and international examples have opened new sights to the way ED nurses' scope of practice has been reformed. The obviously modest estimations of the quality of ED nurses clinical skills currently expressed by the sub-panel of MDs might possibly have something to do with reluctance of MDs' to allow nurses an extended scope of practice. On the other hand, as was demonstrated during the latter Delphi- rounds, the sub-panel of MDs did not object strongly an expansion of ED nurses scope of practice, almost vice versa. However, conflicting views did appear, but they seemed to be more related to individual respondents than the sub-panel the respondents in question were representing. It also seems adequate to emphasize that the conflicting views had been justified with extremely valid arguments. Actual turf-protective comments or

arguments did hardly emerge. The tension between different groups of professionals, mentioned by Hukkanen and Vallimies-Paomäki (2005), might have emerged here. This may be far-reaching speculation, but probably finds its justification from the results.

In the end, the sub-panel of MDs might possibly be claimed biased towards overemphasizing the skills required in the most urgent clinical situations. Should this panel have consisted substantially more for instance MDs with a specialty of internal medicine, the results might have been different. An unavoidable observation appears to be that MDs' proportion of the group of respondents during the second Delphi- round should have been bigger, and a wider variation in the medical specialties they were representing would have been useful. On the other hand, this goes with nursing managers, as well. Yet, whether this possible bias has influenced the results remains unclear.

Should the MDs' perceptions reflect the prevailing reality, and even though they would be exaggerated to some extent, it has to be acknowledged that skills related to assessment of vital functions are probably the most important core skills of every nurse, not to mention an ED nurse. Clinical decisions are made mostly grounded by clinical observations, and should there be hesitation or ambiguity about the importance and clinical relevance of such observations, life-threatening situations may be left unnoticed long enough to cause irrevocable disturbance to the vital organs and functions.

It seems justified to speculate whether items related to vital functions are dealt with in appropriate particularity during basic vocational and further education of nurses. When aspiring to the avoidance of fragmented nursing care there might be a risk of some issues being presented with an excessively general approach. Some items of clinical nursing care should perhaps not be left to be learned during clinical practice alone, which seemed to be the case according to the arguments of several respondents. However, the importance of supervised clinical practice is not by any means questioned here, and domestic researchers have skilfully emphasized its various benefits recently (Mattila and Eriksson 2007, Häggman-Laitila et al. 2007). Yet, it may be justified to ask whether a policy to systematically review the mastery of relevant clinical skills should be established for the evaluation purposes of qualifying nursing students, as is the case with nurse-paramedic students. These findings were unexpectedly bipolar and can be claimed both to be new, to have significant clinical relevance, and to raise a reasoned concern. Comparable findings from the literature with an approach at the same level of particularity could not be found.

The operational environment of ED nurses in 2020

Issues concerning centralisation of emergency health care services and nurses' training emerged to be the most prominent ones under this research question. ED nurses considered that this has continued in an extensive way, while researchers etc. anticipated the centralisation to start to diminish after 2010 due to the newly implemented reformations of communities. This was unexpected, and challenges the almost unanimous perception that centralisation of services nation-widely are necessary. The finding is in disagreement with Duodecim and Finnish Academia (2003), Doupi et al. (2006), FinnSight (2006), Nyman (2006), and Tuukkanen (2007). However, it seems probable that the centralisation of emergency health care services will continue.

In 2020 the vocational and further education of nurses will have been developed, and the focus placed on theoretical and practical skills required in emergency nursing. Educational programmes for ED nursing as well as emergency medicine will have been established. This finding is in concordance with Teittinen (2005), Sariola (2007), Innamaa (2007), and Puolijoki and Tuulonen (2007). ED nurses have not demonstrated noticeable willingness to seek a way into further education, mainly for economic reasons, which would appear to indicate the complexity of the question of the way in which ED nurses' education should be organised in order to avoid excessive education times. This finding supports Kuisma (2007). Even though his report dealt merely with pre-hospital emergency medical care personnel, similarities with ED nurses' education are hard to ignore.

The clinical skills required from ED nurses in 2020

A policy of triage nurses will have been widely implemented, which has turned out to be most valuable. This finding accords with those presented by Thomas (2002), Bruce and Suserud (2005), and Göransson (2006). An obvious need for actively operating triage nurses in each shift of an ED has been indicated by the findings. The almost universal consensus in terms of this issue bears both clinical and scientific relevance. Transition to such a policy outlined under this subject would signify that a comprehensive, albeit not excessively time-consuming, clinical patient assessment should be performed to each and every patient entering the ED for whatever reason, and both immediate life-supporting measures and diagnostic tests be started without delay. It was clearly recognised that successful and active triage is the basis for sound ED care, and the through-put time of ED patients can and should be shortened in order to avoid excessive overcrowding of the centralised EDs. These findings are in concordance with Göransson (2006) and Ruohonen (2007), albeit Ruohonen suggested the triage be performed

by a triage-team consisting of a nurse and an MD. However, Ruohonen's suggestion is based on the observation that nurses' cannot order X-ray tests by their own judgement, and they have to guide the patient to wait for an MD for possible X-ray tests. This was the component that caused unnecessary and avoidable delay.

In this study, the suggested policy included nurse-requested most common native X-ray tests, and was strongly supported. This finding is in concordance with Lee et al. (1996), Meek et al. (1998), Benger (2002), and Chudleigh (2004). Even though an experienced emergency physician might on some occasions be able to make more accurate triage decisions than an ED nurse, the investment of an MD merely to conduct triage in an everyday situation under circumstances where the lack of medical work force is anticipated to worsen annually, does seem quite a heavy act. The emergence of the specialty of emergency medicine may justify a reconsideration of this perception, but according to Innamaa (2007) the triage can be performed fairly reliably also by a non-physician. It should nevertheless be reminded that Göransson provided evidence that triage accuracy is not consistent, and needs to be scrutinised carefully whatever policy is implemented (Göransson 2006).

The results imply that an expansion of ED nurses' practice is not only desirable, but also probable. It was commonly, but not totally unanimously, accepted that by 2020 ED nurses' scope of practice will have been widened, and competence for largely independent execution of a nurse-led clinic was wished for, and considered as an adequate distribution of work. On the other hand, there prevailed an almost universal opinion that nurses' education has been far too theoretically oriented, providing grossly insufficient psychomotor skills for this kind of independent work. This finding fails to support Moisio's discussion (2006), when she states that during the national project for defining the competence requirements of nurses, the mastery of solitary procedures and skills are still emphasised instead of strengthening expertise, commitment to life-long learning, and development of self-controlling skills. The findings of this study might even lend support to an almost opposite conclusion. On the other hand, there is not the slightest reason to underestimate the concern of Moisio. In any case, the few, but strong, expressions of resistance to reforms of distribution of work appear to be in contradiction with Lee et al. (1996), Meek et al. (1998), Benger (2002), Sakr et al. (2003), and Hukkanen and Vallimies-Patomäki (2005). They might, anyway, be reflections of such a tension that was reported by Hukkanen and Vallimies-Patomäki.

The findings lend strong support to the perception that ED nurses' resuscitation and other such skills that are needed in the initial care of any patient brought to the ED should be on such a level that enables independent action according to guidelines until the MD on-call arrives. Intubation was, however, not accepted to be one of the assets of an ED nurse. The findings are not easy to compare to other scientific data, as relevant studies are mainly conducted on areas other than ED. However, Meretoja' s findings showed that emergency and / or outpatient unit nurses rated themselves best in the categories of managing situations and diagnostic functions (Meretoja 2003). The findings of this study may be assumed to be in concordance with Meretoja. Säämänen (2004), in turn, showed severe defects both in resuscitation knowledge and skills. Since these skills were not actually measured within this study, a direct comparison is not adequate. Yet the findings demonstrate and lend support to the importance of these issues.

An unexpected and surprising finding appeared to be the resistance to the implementation of CPAP- care by ED nurses. The argumentation both in favour of and against the availability of this method in cardiogenic pulmonary oedema utilised the same justification: While cardiogenic pulmonary oedema is a life-threatening condition, its diagnosis, treatment and follow-up belongs to a MD. This may be an undisputed truth, but so might be the reply: Because cardiogenic pulmonary oedema is a life-threatening condition, its diagnosis and adequate treatment should be started as soon as possible, before the patient drifts into respiratory exhaustion and altered level of consciousness, when CPAP- care is no longer applicable. The working hypothesis of a cardiogenic pulmonary oedema is relatively easy to learn and to master, and a clear written protocol can be both prepared and followed. The reply is in concordance with the findings of MacGeorge and Nelson (2003). It is noteworthy, however, that the majority of each sub-panel' s members considered this issue desirable. It seems necessary to point out that a brand new report of Thompson et al. (2008) has demonstrated the feasibility and benefits of CPAP- care applied by paramedics in the pre-hospital settings. The authors state that paramedics can be trained to use CPAP for patients in severe respiratory failure. Furthermore, there appeared to be an absolute reduction in tracheal intubation rate of 30% and an absolute reduction in mortality of 21% in patients having received CPAP instead of usual care. Albeit this is only one study, its clinical and scientific relevance, when taken to the ED circumstances, may be hard to deny. From the researcher' s point of view it also sounds rather peculiar if it would be assumed that ED nurses could not be trained to master CPAP- care in appropriately selected patients.

7.2 Validity and reliability

7.2.1 Validity and reliability of the quantitative parts of the study

Validity

This discussion only deals with the validity and reliability issue related to the II Delphi round, even though the results obtained during the III round were also presented as frequency distributions in several tables. The II round was conducted using a questionnaire as a measuring instrument. The content validity of the instrument (Vehviläinen-Julkunen and Paunonen 1998) was aspired to by operationalising the central concept *clinical skill* to a form as measurable and unambiguous as possible. The operationalisation took place after the literature survey and semi-structured interviews were performed in order to construct the instrument to measure various components of clinical skill related to ED nurses' work. Thus the conceptions of numerous stakeholders as interviewees actually were the evaluators of the content validity, which was supposed to reflect the theoretical underpinnings of the measuring instrument (Vehviläinen-Julkunen and Paunonen 1998). The use of respondents who obviously had both knowledge of and interest in the topics may have helped in enhancing the content validity (Hasson et al. 2000).

Due to the lack of an appropriate questionnaire prior to this study, it was constructed by the researcher. Therefore the subjective perception of the researcher was naturally involved in the development and judgement of the instrument, but this is the weakest form of validity (Vehviläinen-Julkunen and Paunonen 1998). Two pilot-studies were conducted to find out how conceivable and comprehensible the questionnaire was considered to be by nursing students. Some reforms were made after the first pilot study. Yet, the reliability and overall competence of unqualified nursing personnel, i.e. students, to pilot a research questionnaire, can be challenged with good reasons. It might have, however, been reliability-augmenting to pilot the questionnaire with more experienced ED nursing personnel, but this option was omitted due to time-constrains.

The construct validity demonstrates to what extent the instrument measures the concept in focus, it tells what really is measured by the instrument (Eskola 1973, Polit and Beck 2004). According to Nunnally and Bernstein (1994), as constructs, such as the questionnaire used during the II Delphi round, concern domains of observables, a better measure of any construct is obtained by combining the results from a number of measures than by taking any one of

them individually. This was the case, as the quality of ED nurses' contemporary clinical skills were assessed by 52 statements, which were compressed using factor analysis to form a group of combined variables (Vehviläinen-Julkunen and Paunonen 1998). It was not possible to find another questionnaire constructed to measure equal issues for assessing the construct validity by parallel measurements.

The assessment of criterion-related validity of the questionnaire is focused on those components of the questionnaire that were related to the possible, and in the last section, desirable, futures of the surroundings of ED nursing. Only the future will tell how accurate are the anticipations that have been made, but a feasible criterion for this part can be considered concerning the issue of whether the option reasonability- requirements have been met, and have all the possible options as well as supporting and rejecting evidence for them been raised (Kuusi 1999). However, the level of success in meeting the requirements of option reasonability will only be possible to evaluate after a reasonable period of time, for it inevitably consumes time to possibly take the findings of this study into consideration when making decisions of educational policy related to nurses' education on a national level. This may sound pompous, but one of the aims of the study was to produce data for decision-making. On the other hand, this endeavour is parallel to the aims that have been reached for in Delphi- studies elsewhere (e.g. Solberg et al. 2003).

In terms of evaluation of criterion-related validity it would have been useful to compare the results of this study to other domestic and international results obtained by an equal measurement. Yet, this was not possible due to the lack of measurement by equal approaches. The face validity, even though not primary evidence of an instrument' s validity, might be considered to indicate an acceptable level, as the respondents had, despite the exhausting length of the questionnaire, completed it with extreme particularity. Arguments for justifying the decisions of the respondents could also be obtained generously. This may be evidence in favour of the face validity. The questionnaire might be assessed to having measured the appropriate construct (Polit and Beck 2004).

Reliability

Assessment of the reliability of this study faces problems, as it is not possible to show that repeating the study with the same questionnaire with similar respondents would result in equal results. Two pilot-studies conducted may have been beneficial, but the reliability of nursing students as respondents with the pilot-studies is worth questioning. However, the use

of a large group of respondents representing (among others) five hospital districts, seven different hospitals, and various levels of hospital hierarchy, was considered to raise the reliability. This effect must not be overemphasised, though, as it is stated that the reliability of a test is directly related to the number of items in the test, not the number of objects used in the study of reliability (Nunnally and Bernstein 1994). The instrument had a total of 107 questions and statements from four areas, each constructed in a different form, which should, referring to the aforementioned, enhance reliability. Yet, such a long and undoubtedly burdensome questionnaire itself may be a factor putting the reliability of the measurement in danger (see Salmela 2004). Whether the possible exhaustion of the respondents was an issue, is uneasy to evaluate. Those, having responded, had carried out the task with remarkable particularity, and no exhaustion could be detected from the questionnaires received by the researcher. On the other hand, it has to be assumed that the low response rate may have something to do with the questionnaire itself.

The stability and equivalence of the questionnaire is not evaluated here, as it was used only once and the researcher conducted all the statistical tests. This was, however, performed with the consultation of a statistician, and the results have been evaluated according to the instructions and guidelines of a professional statistician.

The internal consistency of the questionnaire was assessed in terms of the part measuring experts' perceptions of the quality of ED nurses' contemporary clinical skills. As explained previously, this data were obtained by 52 statements, which were after initial descriptive analyses compressed by factor analysis to form combined variables, which were, in turn, further tested statistically. The internal consistency of the questionnaire, and reliability of the combined variables were, in turn, evaluated with Cronbach' s alphas, which turned out to be 0.658 – 0.909. Only four of them did not reach the level of 0.7, which has been suggested to be the minimum level of reliability of a combined variable (Kanniainen 1999). This can be regarded as evidence in favour of the internal consistency of this part of the questionnaire, as well as the reliability of the combined variables.

From a statistical point of view the disproportion of the respondents in each sub-panel of the II Delphi round was not a concern. Instead, the fact that there turned out to be 167 respondents in the ED nurses', but only 15 respondents in nursing management' s and 26 respondents in the MDs' sub-panel, definitely resulted in problems. The preliminary plan for statistical analyses had to be omitted, and new ones applied. As explained in chapter 5.2.3 the

original continuous data had to be converted to discontinued form, and analyses performed according to that. This could not, however, jeopardize the obtainment of the purposes of the II Delphi round, but caused lots of additional work and was time-consuming. This possibility should have been taken into account beforehand, and a plan B would have been wise to prepare. The estimation of the researcher is that these procedures have not affected the reliability of the measurements, but scientifically as well as clinically interest-arousing issues might have emerged with more versatile analyses of the data.

From the generalisation' s point of view the situation was troubled. The amount and geographical division of respondents representing ED nurses might allow generalisation of the results of the II Delphi round to represent all Finnish ED nurses. On the other hand, the number of respondents representing nursing managers as well as MDs does not allow such generalisations at all. Even though a primary aim of Delphi studies is not generalisation, the possibility of it should be considered, anyway.

Internal and external validity of the results

Internal validity

Interpretation of the results of the II Delphi round was performed by the researcher, which poses a threat to internal validity. The researcher had to continuously keep in mind that when reporting the results, guiding of the reader has to be avoided. This was also addressed repeatedly by the supervisors.

The sampling technique may have contributed to the results, but the amount and quality of that contribution is hard to evaluate. After all, ED nurses were overrepresented and nursing managers as well as MDs underrepresented in the sample. Furthermore, majority of MDs were anaesthesiologists, which might also have biased the views shown by MDs' sub-panel. Even though respondents were selected to cover the appraised stakeholders with sufficient geographical coverage, it was not entirely nationwide. This issue was resisted by recruiting a random sample of the members of The Finnish Association of Outpatient and Emergency Ward Nurses, wishing that the geographical coverage might be enhanced in this way. Due to the lack of data concerning members' working places this remains as a speculation, however.

External validity

The evaluation of external validity of the results is focused on the generalisability of the research findings to a wider perspective (Polit and Beck 2004). The method of scientific

inquiry of this study was Delphi- technique approaching Argument Delphi. Wide generalisability, in turn, is not the aim of Argument Delphi studies (Kuusi 2002), and great caution should be exercised, if trying to generalise the findings of the II Delphi round to larger populations.

On the other hand, and as will be discussed in more detail in the chapter Limitations, when assessing the generalisability, the response rate has to be scrutinised. The total return rate was 47.7%, which is no more than tolerable. The return rate was as its lowest in one of the hospitals (23.5%), and the highest in the group of 'Others' (100%). The highest return rate from the hospitals was 64%. This results in the median return rate of 49%. These low figures are not unforeseen within postal Delphi studies, and this issue has been recognised as a major threat to the external validity of their results (Kuusi 2002). Mainly due to the burdensome and complicated feasibility for the respondents, no reminding letters or e-mails were sent in order to enhance the return rate. This might still have been wise.

7.2.2 Validity and reliability of the qualitative parts of the study

The I Delphi round was conducted by semi-structured interviews, and the III and IV round by questionnaires addressing qualitative issues. Silen-Lipponen (2005) refers to Sandelowski and Barroso (2002) when stating that qualitative study is based on such a belief of a social world that there is no universal truth or unequivocal reality, and research therefore cannot prove anything. This Delphi study aims at discovering and unveiling pathways to possible futures, and an unequivocal truth is not intended to be revealed. Instead of that, the arguments presented to justify the perceptions expressed have been the object of major interest, and the ultimate aim has been the production of useful futures' arguments to support political decision-making (see Kuusi 2002). The following discussion of the trustworthiness of the qualitative parts of the study will be conducted according to the general criteria of trustworthiness presented by Kylmä and Juvakka (2007).

Identification and assignment of the phenomenon in focus

The object of the study, clinical skill, was defined according to the researcher's pre-comprehension, literature survey, and interviewees' perceptions of the concept. A historical background was constructed and revealed in order to avoid such an impression that the idea of *skill* as not a purely technical, but as a larger and theory-related concept, would be merely a fixed idea of the researcher. Attewell' s (1990) approach, according to which skill is a

synonym to competence, but generates a notion of expertise, mastery, and excellence, and an association with knowledge and understanding, was largely utilised in this study. The approach was, however, transferred to clinical ED nursing circumstances, and thus the main concept was named clinical skill. The publication of the Finnish Philosophical Society from its colloquium dealing with *Skill* (Niiniluoto et al. 1992) provided strong support for the philosophical and scientific underpinnings of this concept of vital importance in this research.

Yet, the researcher seems to be obliged to admit that such concepts as competence, proficiency, and qualification may be hard to distinguish from the core concept of the study, clinical skill. The motivations of the researcher for using such a vaguely distinguishable concept may be challenged, as well. With reference to the results of this study, and due to the very nature of ED nursing, however, it seems justified to claim that clinical skill is a concept covering the various aspects of this particular discipline of clinical nursing. The subjective perception of the researcher remains to be that clinical skill is still excessively connected to psycho-motor performance leaving knowledge and understanding aside. A previously unspoken reasoning for the use of clinical skill as the core concept was the aim to write this thesis as a tribute to all those ED nurses having worked without sparing their efforts for obtaining high-quality clinical skill in order to help those in the need of it. The scientific community will decide, whether the definition and reasoning of the concept has been performed in a satisfactory way.

Reasoning of the importance of the study in terms of content, methodology, and ethics

The study belongs to the domain of clinical nursing, and has been conducted by the orientation of futures studies, the method applied being Delphi- technique. According to the principles of the National Health Care Project, the distribution of work has been taken under scrutiny. A worldwide concern of patient safety, centralisation of emergency health care services, and impending lack of work force have been the main impetus for this approach. From domestic nursing science's point of view, clinical emergency nursing has not been a popular area of interest among researchers, a lack which this study aspires to counteract.

There obviously has existed a gap of knowledge in this respect, as well as a constant need for novel approaches of scientific endeavour applying and developing methodology within the domain of clinical nursing science. Argument Delphi –technique has not been widely, if at all, applied to clinical nursing science. This has been one rationale behind the endeavour to

approach this method, albeit the method applied is not totally justified to be called Argument Delphi, but Delphi- technique with features of Argument Delphi.

When aiming at studying futures' issues, the possibilities are not infinite. Futures cannot be observed or measured directly, but perceptions of futures' topics can be asked from persons considered as experts in their own field of action. A qualitative approach remained the method of choice, which has been considered relevant in terms of the purposes and aims of this study.

The perceptions of experts in terms of the clinical skills required contemporarily from ED nurses were gathered by semi-structured interviews during the I Delphi round. The III and IV Delphi rounds were, in turn, constructed to reveal the experts' perceptions of future working environments in EDs, the organisations of future EDs (the big picture), and the probability and desirability of redistribution of certain tasks related to emergency medical and nursing care. The III Delphi round was conducted using mailed questionnaires containing three scenarios of future emergency health care issues, mainly to outline possible future working environments, again the big picture. Preferences of possible redistribution of certain tasks related to emergency medical and nursing care were asked for as well. The responses were analysed and reported in qualitative style according to sub-panels, albeit frequency distributions were also provided to enhance clarity and understandability. The IV Delphi round was constituted by four experts, one representing each sub-panel, commenting on the results of the III Delphi round. These were analysed and presented in qualitative form as a result of a content analysis. The ethics of the subject of this study arises from patient safety issues, as well as the aspiration of creating a cost-effective emergency health care system.

Assignment of the purpose of the study and research questions

The purpose of the study has been assigned to be the acquisition of experts' perceptions of the clinical skills required contemporarily in ED nursing, and in the long-range futures, as well as the perceptions of the future working environment in ED nursing. It seems justified to claim that the assignment of the purpose of the study is unambiguous, and the success in terms of its achievement can be evaluated.

The research questions related to the qualitative part of the study have been assigned to be: What kind of clinical skills are currently required from ED nurses, what will the operational

environment of future' s ED nurse be like, and what kinds of clinical skills will be required from ED nurses in 2020.

The initially defined purpose and research questions of the study have remained in their original form. The objectives as well as the research questions could be evaluated to lend themselves to studying with Argument Delphi- technique. According to Kuusi (2002) the technique is suitable for detecting and timing of subtle break-points and turning points of future development. Furthermore, Delphi technique- is a sensible method of scientific inquiry within objects, where the reforms are still growing and have not got out of hands so that they can no longer be affected by planners. With clinical emergency nursing this can be claimed to be the case, as an official educational programme for these purposes is still lacking in Finland, and a generally accepted concept for the nurse working in ED has not been defined.

Description of the data collection

Data collection was conducted using methodological triangulation in sequential form. During the I Delphi round the data was collected using semi-structured interviews, while the III and IV round consisted of inquiries by questionnaires. The interviewees were selected by purposive sampling technique (Denzin and Lincoln 2000), the main criterion being acknowledged expertise in terms of either clinical or educational emergency nursing, or emergency medical care. Participants for the III round were also selected by purposive sampling technique, and each participant was recruited to fill a certain place in the matrix constructed according to fields of expertise and interest groups, i.e. stakeholders in terms of the phenomenon to be scrutinised in the study.

Participants for the IV round were recruited emphasising their willingness, availability, and expressed ability to produce relevant and justified arguments to support their judgements. One review-panellist was recruited to represent each sub-panel.

The concept of a stakeholder implies that the person fulfilling the requirement of a stakeholder must possess subjective experience from the research issues from such an angle that can be considered useful and that enables the bringing of something new and valuable as well as conflicting interests under discussion. A stakeholder either can have an influence on the issue in focus, or that issue can influence the life of the stakeholder (Korhonen-Yrjänheikki 2004).

According to Kuusi (1999, 2002), getting started with experts' interviews is often suitable for Argument Delphi studies. However, it might have been productive to conduct the III and IV rounds with experts in face-to-face meeting, but this was not a feasible option for economic and other practical reasons. Questionnaires have been used for data collection purposes with Delphi studies, but the risk has appeared to be unresponsiveness. This was not the case with this study, as 35 of 36 panellists returned the questionnaire during the III round, and all four review-panellists during the IV round.

A more detailed description of the selection of the themes of the interviews might have been appropriate. The questions were very detailed, and it might have been beneficial to leave them to be more general in order to have the personal thoughts of the interviewees more clearly elicited. Saturation of the material was noticed, but all the pre-planned interviews were conducted to obtain not only the perceptions of a fairly large group of different experts, but also to consider the composition of the later Delphi- panel.

Analyses of the qualitative data

The qualitative content analysis conducted with the data produced by the interviews has been described in stages. The logic of the abstraction process has been explained in detail. Original expressions have been provided, perhaps excessively, but the data were so generous that it has been problematic to rule out numerous descriptions. A qualitative research approach is suitable for areas that have not been thoroughly investigated previously (Nieminen 1997). This requirement can be claimed to be fulfilled, as clinical skills as a concept have not been studied, and the use of Argument Delphi –technique in clinical nursing research is still in its infancy.

A new way of describing the clinical skills required contemporarily from ED nurses was the outcome of the process of qualitative content analysis. The pathway of the abstraction process has been described in detail. This outcome might serve as background data when considering reforms of the curriculum of nurses' vocational or further education.

The description of the analyses of the data produced by the Delphi-panels has been described rather briefly, but the process however is expected to be evident. Even though a qualitative approach has been obeyed, simple frequency distributions were tabulated and presented. The findings were processed according to each sub-panel, and they are presented in that way as well.

The data produced by the review-panel during the IV round has been presented as the production of one group due to the small number of panellists. This decision was made mainly to protect the anonymity of the panel members.

The content analyses conducted for the material of the III and IV round was arranged mainly according to arguments in favour of and against the issues and statements presented. Original expressions were provided generously in order to enable a consideration of the researcher's interpretation of the original material. However, it might have been useful to provide a more systematic frame of analysis for the evaluation of the analysing processes. Using another researcher for analysing and categorising the qualitative data would definitely have been useful, and would have enhanced the credibility of the analyses. Furthermore, it would have been beneficial to feed the results of the analysis process back to some of the interviewees of the I round. The results of the III round were fed back to the review-panel, and for this part the credibility of the findings may have thereby been enhanced.

Keeney et al. (2001) have discussed the performing of pilot tests within Delphi studies. The tests were conducted in this study before implementation of each Delphi round, the IV round excluded, and some changes were also made according to the suggestions of the pilot testers. This was assumed to promote the feasibility of administration, as well as the credibility of the study.

Finally, despite the focussed effort to construct mutually exclusive categories, there may have been left some vagueness or overlapping which has not been detected and omitted by the researcher. Should this be the case, the abstraction and categorisation processes have not been fully accomplished, which, in turn, may decrease the value of the study.

Reporting the findings

It seems inevitable that the researcher's pre-comprehension and clinical experience of clinical ED nursing have overlapped with analyses of the data and scientific underpinnings of the study (Nieminen 1997). In spite of a conscious and constant effort to avoid excessive subjectivity, both in qualitative analyses and reporting of the findings, the background and clinical orientation of the researcher may show in an unwanted and inappropriate way. This impending risk might have been managed by the use of two or more concurrent analysers of the qualitative data.

The collection and analyses of the data have been reported according to each Delphi round in order to enhance the clearness and readability of the report. The generosity of the material has, on the other hand, resulted in the need to make a gruelling selection of the data published. This process is inevitably based on the researcher's perception of the scientific and clinical importance and relevance of the data, and the decisions made can thereby be challenged. The guideline has been the purpose of the study, and the obtaining of answers to research questions.

Patient safety and health promotion are primary interests in health care worldwide, and especially the latter has been strongly advocated by WHO during its 60th anniversary in 2008 (WHO 2008). The findings of this study are offered to be made use of when planning actions for the evolution of one link in the chain of survival of acutely ill or injured patients, which, in turn, is in sound concordance with the worldwide aims of health promotion. From the researcher's point of view, this should be the ultimate purpose of all research activities within the domain of health care.

7.2.3 The six success-criteria of Delphi- studies

The final evaluation of the success of the study will be performed according to the six preconditions established by Kuusi (2002) that can be used as evaluation criteria for Delphi-studies (Korhonen-Yrjänheikki 2004).

1) Success in selection of the experts' panel

The selection of the experts' panels was conducted bearing in mind the relevant stakeholders, albeit no theory of stakeholders was implied (see Korhonen-Yrjänheikki 2004). Interest groups and areas of expertise relevant to the topic in the focus of the study were defined, as well as a matrix to be filled with panellists' names. The Delphi panels for the I, II and III round can without exaggeration be called comprehensive, and they encompass very profound expertise both from the clinical, educational and administrative issues. The review-panel for the IV round was small, but had, with the exception of one member, participated in all previous rounds, and can without hesitation be claimed to possess profound expertise as well. In addition to their expertise, all the panellists demonstrated willingness to produce well-reasoned arguments.

2) Anonymity of the argumentation

The anonymity of the panellists has been aimed to be during all rounds, which can be considered as an ethical obligation of the researcher. However, it has to be emphasised that the anonymity refers especially to the comments and arguments of the panellists. During the three first rounds it was not possible to keep confidential who was interviewed at each work place. Neither was it possible to prevent workmates from knowing who had returned a questionnaire to the collecting box.

With the III round, the 36 panellists received information of the whole panel in terms of the names and occupational status of each panellist in order to enable the panellists to perceive whom they are dealing with, and to motivate them as well. However, any information concerning the actual arguments and comments to the extent that the anonymity might have become violated has been avoided avoiding. Due to the fear of breaching anonymity, only minimal information concerning the person behind the arguments of the III Delphi round has been provided, not even the gender has been mentioned. For the same reasons the comments of the review-panel have been provided mainly as one panel, and more detailed individual information has not been published.

3) Success in the finding of reasonable framing of questions

The Delphi process was initiated by 34 experts' semi-structured interviews, which were conducted by the researcher. The themes were based on clinical experience as well as scientific data gathered through the literature review. At the end of each interview the interviewees were asked whether there would still be something they would like to add or talk about, and several issues were raised. There emerged issues, however, which might have been useful to investigate more thoroughly, but detecting all such instances would have taken a more experienced interviewer. A mind map was constructed by the researcher from the outcome of the textual data of the interviews. The mind map served for its part as material for constructing the questionnaire for the II Delphi- round.

Some issues were continued through during the three first rounds, but the framing of questions was aimed at elaborating continuously. It is justified to deliberate whether it might have been beneficial to construct the III Delphi round so that the interest groups might have been offered different issues to scrutinise. For example, the ED nurses and emergency MDs might have been offered the same issues, while the administrators and the researchers, teachers, bystanders respectively their own ones.

4) Experts' panel' s structured discussion of the statements and arguments behind them

The panellists provided generously comments and arguments to justify them. It can be claimed that, along with the argumentation, largely opposing and versatile views of the issues under discussion have been revealed, which is a role of utmost importance in Argument Delphi- studies (Kuusi 2002). Even though statements concerning the future mainly carry no truth value, the arguments that are provided for justifying these statements are here interpreted as carrying it.

On the other hand, the arguments fed back to the panellists might have been more strictly organised and systematic. Furthermore, all the results of each round and the argumentation obtained should have been returned more actively and in a clearer form to the participants of the next round. Room for clear improvement of the rigour of the technique used remained.

5) Ability to gather by systematic and user-friendly assessment relevant arguments of the futures from various, and various kinds of, experts

The researcher has conducted a qualitative content analysis with a deductive approach for the generous material obtained by 36 experts' interviews. This analysis has resulted in a new way of describing the clinical skills required contemporarily from ED nurses. Even though the I Delphi round dealt with contemporary issues, it also served as a basis for the II round, which dealt largely with futures' issues.

The responses in terms of the quality of ED nurses' clinical skills have been compressed by factor analysis to form combined variables, which have been tested against the three sub-panels. This has hopefully made the data more comprehensible, and provided grounds for construction of the III round's scenarios and statements.

Three alternative futures concerning the state of Finnish health care, and especially the working environment and circumstances of ED nurses, as well as 13 statements related to the possibly expanding scope of ED nurses' practice, were provided for the panellists of the III round. The panellists were encouraged to comment on the scenarios in terms of their probability and desirability. In addition to that, the panellists were asked to consider whether there might exist issues that should be omitted from the scenarios or added to them. Some issues accompanied with arguments for justifying them were received, but only a few panellists proposed issues to be omitted from the scenarios.

One panellist, however, considered the scenarios so biased, and purposefully directed to prove the usefulness and advantageousness of the expanded scope of ED nurses' practice that no comments on the scenarios and statements were obtained from that panellist. In addition to that, there were comments from two panellists in concordance with the aforementioned. This has not been the intention of the researcher, albeit the scenarios were purposefully constructed to promote argumentation, which, on the other hand, did happen.

6) The relevance of the data in terms of decision-making

This study amplifies the storage of scientific data related to clinical nursing science, and especially the limited domestic data bank of clinical emergency nursing. It may not be unjustified to claim that the findings of the study provide applicable background material for planning purposes, both in terms of nurses' education and health care emergency services. The views of major stakeholders have been revealed and reported so as to be utilised in visionary management.

7.3 Limitations

There are limitations to this study. Part of them are related to the researcher's conscious choices that always have to be made within scientific research, while others are more likely related to the inexperience of the researcher in using Delphi- technique.

The response rate during the II Delphi round

The response rate during the II Delphi round remained relatively low, albeit an exact figure cannot be presented due to the fact that reliable knowledge of the number of nurses being in a position of answering the questionnaires could not be obtained. The nurses of the seven hospitals' EDs represented 85% of the total number of respondents that were pursued, and uncertainties in the actual number of available respondents may distort the estimation. This assumption is based on the figures obtained from each hospital, but could not be verified from the questionnaires as this item was incompletely responded to. The relatively low response rate hampers the generalisation of the findings of the II Delphi round. A power analysis would have been useful in estimation of the sample size (Polit and Beck 2004), and might have guided the execution of the II Delphi round more strictly.

Possible bias

It is hard to avoid the possibility of bias when using purposive sampling techniques. During the I Delphi round some of the interviewees were selected by the ED unit managers, which

leaves room for speculation that the most active and skilled might have been chosen. The same risk is applicable to the II round's inquiry, the response to which was left for each individual's decision. It can with justification be claimed that the most active and qualified persons will have responded. The panellists for the III and IV round were selected according to the pre-determined criteria explained previously, but a common denominator for all of them might, however, be defined to be some kind of activity. While these possible bias-inducing factors cannot totally be bypassed, they should be taken into account when scrutinising the results. The information policy issues should perhaps also have been assessed more profoundly.

A bias-inducing factor may have been the small number of nursing managers and MDs during the II Delphi- round. Regardless of the fact that Delphi studies, especially Argument Delphi-studies, do not aim at assembling statistically representative groups of panellists, the amount of nursing managers and MDs sub-panels during the II Delphi- round should probably have been bigger. Furthermore, the composition of MDs' sub-panel during the same round was too one-sided favouring anaesthesiologists.

Lack of the patients' views

Emergency health care services are established and maintained for the end users – for patients. All publicly funded activities should be evaluated not only from the experts', but also from the end-users', perspectives (Ruotsalainen 2006). In the case of Delphi- studies, the gathering of expert panels plays a role of vital importance (Kuusi 1999, 2002). However, this study dealt with issues related to clinical skills of ED nurses currently and in the long-range future. It was a conscious choice of the researcher to omit the views of patients from the panels due to the basic assumption that laymen are not capable of considering issues profoundly related to the terminology, concepts and practices of emergency medicine and nursing. Professional jargon (e.g. intubation, ventilation, laryngeal mask) has been used frequently, which might have been difficult for a layman to understand clearly enough.

On the other hand, when anticipating the future operational environments of EDs, the perceptions of laymen might have brought views left unnoticed by professional experts. Overall, this decision can justifiably be questioned.

Perceptions of the skills of ED nurses, not actual evaluation of the skills

It seems reasonable to point out that this study is not measuring or evaluating the actual contemporary skills of ED nurses straightforwardly with measurement techniques. What has been obtained, is experts' subjective perceptions of those skills. Perceptions are not necessarily the same as the results of objective measurements, which should be kept in mind when considering the clinical implications of the research findings.

Ignoring the future' s technological development

This study has not entered deeply into the possible technological developments that might turn out to have profound influence on the subjects in the focus of this study. Even though technological development may be extremely hard to anticipate, especially by a non-technologically oriented researcher, this has to be confessed as an obvious shortcoming. It is most probable, however, that within the time-frame defined for the study, approximately fifteen years, inventions such that will have fundamental effects on clinical ED work will be made. Wireless patient monitoring may by then be an everyday routine, advances in bio-medicine as well as in bio- and nanotechnology can have remarkable clinical applications. Development of information and communication technology might promote technology-assisted self-service, which, on the other hand, might affect the needs of citizens living in remote areas to seek their way to the few EDs still existing (FinnSight 2015, Vuorenkoski et al. 2006.).

Yet, with reference to von Wright (2007), the reappraisal of the relationship between human beings and nature appears to be the most important intellectual challenge posed to mankind in our time. All technological advancement has not been merely a blessing. Nature, dominated by the technological human being, will strike back (von Wright 2007). In spite of all the fabulous technological achievements, every problem cannot be solved by a new technological breakthrough without side-effects. That growth has its limits, as has been strongly advocated by Meadows et al. (2005).

Due to the fear of overvaluation of technological development at the cost of emphasising subjective humane skills related to work that is always performed between two or more human beings, the possibilities of technological development have been under-addressed in this study. This may be an incomplete and unsatisfactory scientific explanation, but after a profound and extended soul-searching it remains as the only one.

Construction of the scenarios

According to Kuusi (2007), a crucial characteristic of an Argument Delphi study is the pursuit of performing mapping and finding several trustworthy pathways to the future. Correspondingly, scenarios should be constructed to form a logical, believable and time-related pathway. When this pathway has been negotiated it has led to a certain vision. At the beginning of the pathway there might exist some phenomenon that causally leads to next steps along the pathway until it has been negotiated fully, and arrives at an end-point. The end-point can be called a vision, if it can be considered a positive phenomenon, and a dystopia if it is negatively coloured. The construction of the scenarios ought to be made in such a way that the end-points and mid-points are clearly distinguishable.

This has not been the case in the construction of the scenarios of this study. They were constructed with less rigour, and were based on the knowledge gathered during the I and II Delphi round as well as the background data obtained from distinguished scientific sources anticipating the futures of health care in Europe, and especially the European Union. These data were attached to the questionnaires sent to each Delphi panellist of the III round. The scenarios did not form clear time-related pathways with clearly distinguishable beginnings, mid-points and end-points. The time-frame has probably also not been described with sufficient particularity. The construction of the scenarios resembles probably more the way that anticipatory scenarios (Hynynen et al. 1979) have been built. With them, the end-points are described first, and then the pathways for reaching them. Furthermore, the panellists, being in the position of responding to the scenarios, should have been situated more clearly in relation to the year 2020 when looking back and evaluating the trustworthiness and probability of issues described in the scenarios.

All the critical variables were not the same in each of the three scenarios, and this may have resulted in an overemphasising of the importance and role of the ED nurse in the scenario 'ED nurses' profession is evolving'. This was raised by two panellists to be an issue, and they objected to the importance that was placed on the role of one group of health care professionals. The main problems were mentioned not to be what the triage nurse does and does not, but rather the problems were said to be strongly related to overstretching the capacities of EDs, together with the severe obstacles in the outflow processes – patients not moving forward from the EDs, which inevitable results in congestion no matter how skilled the ED nurses are. This cannot by any means be denied, and should probable have been made more explicit in the scenarios.

Construction of the statements

Useful data might have been obtained if the statements had been constructed to anticipate the *quantitative probability, e.g. percentage probability, by which a certain issue might have been realised by the year 2020*. Another way of constructing the statements would have been to ask: *when does this statement realise?*

Validity of the argumentation

The validity and possible bias of the experts' argumentation has not been questioned within this research report. With reference to Kuusi (1999), scientists are committed to tell the truth, and truthfulness is the necessary condition for science. However, it is not possible to provide empirical truths about the future, but it is possible obtain and express truthful arguments concerning them. The experts' arguments obtained within this study have not raised any concerns in terms of possible bias towards the interests of some group(s) of stakeholders. A general impression was prevailing that the reasoning as well as the argumentation was more dependent on the individuals themselves than on the interest groups they were representing. On the other hand, it might not have even been possible to detect possible bias should such a doubt have appeared.

Delphi technique and Argument Delphi- method

This study was performed according to principles of such a Delphi- technique that has been conducted with repeated surveys and included features of Argument Delphi- method. Even though Argument Delphi has been derived from Delphi- technique, they have differences, as well. In this study it has appeared to be rather difficult not to use both of these concepts. Despite the aspiration to clearly state each time, which concept is used and why, the using of two closely related methodological concepts probably has been disturbing for the reader. Yet, the researcher has not been able to omit either of them when trying to avoid insulting the principles of either of these methods.

From the methodological point of view it might have been beneficial to select one purified method to obey. Researcher' s ambitious aspiration to mix traditional survey and Argument Delphi has caused some problems. It may also have resulted in some kind of illegibility of the research report, which has turned out to be extremely difficult to get rid of.

8 Conclusions and implications

The purpose of this study was to reveal and describe the current, and anticipate the future operational and educational requirements with special reference to ED nurses' clinical skills. The time frame was set to the year 2020.

The findings justify reaching the following conclusions. The clinical skills currently required from ED nurses are tightly connected to managing and controlling the risk of both each individual patient, and all those patients an individual nurse is accountable for in a certain shift. Furthermore, ED nurses should be able to control and foresee the whole situation of the ED, as one of the core characteristics of ED nursing appeared to be the constantly ubiquitous possibility of change. This was recognised to be a suitable role for a triage-nurse, who should master the whole situation and co-operate actively with the nursing and medical staff of the ED as well as EMS.

A novel way to describe the clinical skills required from ED nurses currently, 'Skills for wise risk management', was developed as the ultimate outcome of the analyses of the experts' perceptions. Skills for anticipating and skills for managing the issues at hand were revealed as the major components of the theoretical model, and are related to the work of ED nurses by providing assets for anticipating the clinical course of patients, and for recognising a high-risk patient among others without the use of technical devices. Skills for systematic assessment and prioritisation of both patients and tasks emerged as key skills, and which are widely applicable to clinical nursing. Core elements of theoretical knowledge required consisted especially of the natural and nursing sciences. Comprehension of pathophysiologic mechanisms turned out to be a pre-requisite for competent ED nursing.

The quality of ED nurses' clinical skills appeared to be very diverse. Pain management received a considerable amount of attention. A fundamental finding was that the patients' pain tends to be recognised, but is not treated adequately. MDs' perception of this item was particularly negative. The most alarming discrepancy of the perceptions between ED nurses' and MDs emerged, however, in terms of assessing vital signs and responding adequately when required. These fundamental skills were assessed remarkably poorly by the MDs compared to ED nurses' as well as nursing managers' assessments. The discrepancy was so evident that it cannot be ignored in the future when scrutinising a possible need for both

revising current education of nurses and establishing a dedicated further education programme for ED nurses called ‘Acute nurse’, as was suggested.

In 2020 the centralisation of emergency health care services is expected to have continued, and those EDs still left will be under constant and growing pressure. A special educational programme would finally have been established for ED nurses, whose skills are regularly evaluated. Methods of intensive care would be applied routinely, and outflow of patients will be burdensome, resulting in growing demands for basic caring work as well as skills previously needed mainly in the ICU.

The working environment in 2020 will have several features worth noticing. ED nursing will have developed towards a status of being its own specialty as will have emergency medicine as well. ED nurses with special education will be running nurse’s receptions within EDs, but their independence will not be as far-reaching as with for example North-American nurse practitioners. However, the scope of ED nurses’ practice will have been expanded, and the role will be remarkably active. Special attention will have been paid to ED nurses’ ability to detect high-risk patients and to initiating life-supporting measures. Emergency physicians will hold the ultimate responsibility, and the most severely ill and injured patients will always be dealt with by them from the very beginning of their appearance in the ED.

Co-operation with EMS will be tight, and the care of ED patients will be considered to be just a natural continuum of the care starting from the moment the patient ceases being healthy, and will be executed at the pre-hospital phase. Triage nurses will be an everyday routine in each ED and each shift. They will classify patients according to standing orders to three or five levels of urgency of care. The accuracy of triage decisions will be monitored and feedback, as well as additional training, will be is offered regularly. Triage-nurses will be responsible for initiating the diagnostic procedures, including requesting laboratory tests and native x-rays.

The results of the study can be utilised in working-life, in e.g. recruiting, orientation and development of health care organisations and nursing practice. The results are also applicable when re-defining working roles between physicians and nurses as recently reported by Kärkkäinen et al. (2006). When establishing the objectives and evaluation methods for vocational basic and further education, and for developing the curricula, there is a call for data that hopefully can be produced by this research work. When planning educational programmes for post-graduate degrees at the Universities of applied sciences, one field of

interest may be an aspiration to promote special competence in ED nursing, so that the results of this research work may also serve this purpose.

8.1 Clinical implications

The findings lend support to clinical implications, as follows:

1) Strengthening nurses' theoretical and applied knowledge base in terms of the natural sciences during vocational and further education is recommended. Especially an enhancing of the apprehension of pathophysiological phenomena should be seriously considered.

2) Nurses' education, with emphasis on skills needed in assessing the clinical condition and prioritising of acutely ill patients, needs to be carefully considered. Preparedness for the triage-nurse's role ought to be provided during both vocational and further education. Development of an official education programme in patient triage for nurses might be worth serious consideration. Established criteria for the qualifications of a triage nurse might be considered by the central administration. The centralisation of emergency health care services probably results in worsening congestion and lengthening through-put times in EDs, which in turn will set new requirements for both preliminary and repeated patient triage.

3) ED nurses' ability to react adequately to what has been discovered should be promoted. The observation of impending or present disturbances in patients' vital functions should result in appropriate and timely actions. Patient monitoring ought to be meaningful from both the observer' s and patient's points of view.

4) Pain management was found to be at an unsatisfactory level, even though pain was recognised. These findings indicate that it might be worth strengthening such an apprehension that adequate pain management is both a human being's basic need and a basic right. Thereby it might receive the status of a fundamental moral and ethical issue, which, correspondingly, would be essential to be advocated during nurses' vocational and further education within work-places. It is hard to imagine clinical issues more tightly connected to the very core of the nursing and caring role of ED nurses.

5) Distribution of work between ED nurses and MDs might be worth careful consideration in order to hasten responses to patients' needs, and to enhance ED nurses' autonomy and the meaningfulness of their work, as well as to relieve the burden of MDs on-call. This should, however, be executed with thorough consideration of issues of education, responsibilities, and

especially patient safety. The quality of basic caring of the ageing patient population should also be guaranteed. Whether this requires a reconsideration of the occupational profile of health care professionals working in the EDs, or reassessment of the personnel resources of EDs, remains to be determined elsewhere.

6) Whether the expansion of ED nurses' scope of practice indicate the issue of entitlement to set a medical diagnosis in order to serve as the basis of requesting laboratory and x-ray-examinations, as well as prescribing and writing various official certifications, should be resolved in a way that can be accepted by all stakeholders.

7) The researcher recommends that the stakeholders, and especially the Ministry of Education as well as the Ministry of Social Welfare and Health, might possibly consider whether the policy to educate 'generalist' nurses, and whether the free movement from one workplace to another probably is flexible and fluent, will be valid in the future. Should there, instead or in addition to that, be a possibility to obtain more profound familiarity in certain areas of clinical nursing, e.g. emergency nursing? Or could there be established an official further educational programme aiming at profound competence in clinical emergency nursing? It appears to be justified to claim that the needs for profound expertise in various fields of clinical nursing are not going to diminish. Whatever the decision will be, the findings of this study would appear to indicate that clinical and practice-guided orientation of nurses' education should be seriously considered.

8.2 Implications for further research

The following implications for further research derive from the research findings:

1) An actual evaluation of ED nurses' clinical skills by means of objective measurement, instead of obtaining perceptions of them, might shed new light on this matter. This kind of research approach would be possible to arrange, and the findings might provide data to be utilised in planning nurses' vocational and further education.

2) Due to the lack of a universally accepted scientific theory applicable for emergency nursing, this issue should deserve scientific attention in terms of both basic and applied research aiming at theory construction. Whether such a theory might be related to risk management remains to be decided later. The findings, however, appear to indicate that risk management plays a role of vital importance in clinical ED nursing.

3) Ways by which to shorten patients' through-put times without jeopardising safety would definitely deserve scientific endeavour. ED nurses' contribution and possibilities in terms of this aim would be worth studying within controlled research settings.

4) Accuracy of ED triage has frequently been an object of scientific research internationally, but domestic research reports in Finland are sparse. Since the findings suggest that the importance of triage functions will play a major role in the future, research activities would be justified to be directed towards this primary phase of ED care.

5) The findings in terms of pain management inadequacy would appear to indicate a need to investigate ways to improve this situation. The research settings might be directed towards the enhanced autonomy of ED nurses in assessing pain, managing it according to standing orders, and evaluating the response. Examples of working policies are not hard to find within pre-hospital emergency medial care organisations.

6) Argument Delphi- technique was the method that was approached, but not completely reached, in this study. Clinical nursing studies have only infrequently been executed utilising this research approach. The experience gained provides evidence in favour of the applicability of Argument Delphi –technique in clinical nursing research. However, the technique appears to be very demanding, and requires a significant effort and consideration of various issues during the Delphi rounds. More scientific evidence of the application potential and experience of the ways to utilise the technique should be gathered.

7) Finally, various methods for pursuing enhanced team-work and communication, i.e. crew resource management, might advantageously be investigated. For example, up-to-date simulation techniques could provide fruitful platforms from which to construct controlled, well-designed intervention studies.

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I

APPENDIX 1. TABLE 1. Finnish population by age (frequencies), and the percentage share of males and population living in urban areas (The National Research and Development Centre for Welfare and Health, STAKES, 2006a).

Years / Age, yrs	1995	2004	2004 Males	2010 (Estimated values)
0 - 6	454’940	398’826	204’042	405’114
7 - 14	516’830	515’734	262’838	466’413
15 - 24	632’169	651’469	333’068	652’975
25 - 49	1’952’541	1’756’713	893’543	1’700’431
50 - 64	827’929	1’082’929	537’928	1’160’889
65 - 74	432’277	450’525	203’977	506’711
75 - 84	233’122	297’340	106’592	313’242
85+	67’018	83’075	20’089	103’881
Total population	5’116’826	5’236’611	2’562’077	5’309’656
Males, %	48.7	48.9		49.1
Population in urban areas, %	58.2	62.3	61.2	63.4

TABLE 2. Finnish population by age in 1995 – 2010, percentage shares. (STAKES 2006a).

Year / Age, yrs	1995	2004	2004 Males	2010 (Estimated values)
0 - 6	8.9	7.6	8.0	7.6
7 - 64	76.8	76.5	79.1	75.0
65-74	14.3	15.9	12.9	17.4
75+	5.9	7.3	4.9	7.9

II

APPENDIX 2. TABLE 1. Causes of death annually in Finland in 1990 – 2004, frequencies. (STAKES 2006a).

Year	1990		1995		2004	
Cause of death	Deaths	Deaths / 100'000 inhabitants	Deaths	Deaths / 100'000 inhabitants	Deaths	Deaths / 100'000 inhabitants
Disease of the circulatory system	23'988	499.5	22'662	426.9	19'642	307.7
Neoplasms	10'086	204.9	10'321	194.0	10763	172.3
Diseases of the respiratory system	3'750	79.8	3'761	71.1	2'971	46.6
Disease of the digestive system	1'317	27.6	1411	26.6	1'183	21.2
Alcohol-related diseases	1'161	22.5	1'194	21.7	1'860	30.3
Injury and violence	4'351	87.6	3'956	75.1	3'872	67.5
- of which injuries	2'483	50.6	2'274	44.4	2'584	43.7
- of which suicides	1'520	30.0	1'389	26.6	1'064	19.7
Total	50'091	1'036.8	49'326	929.2	47'757	765.1

III

APPENDIX 3. TABLE 1. Treatment episodes in somatic specialised medical care in 2004 by frequencies, and percentage share of urgent admissions in some diagnostic groups. STAKES 2006b.

Diagnostic group	Treatment episodes, frequencies	Urgent admissions, %
Diseases of the circulatory system	142’310	54
Neoplasms	118’020	18
Injuries, intoxications etc.	92’003	61
Diseases of the digestive system	84’968	47
Diseases connected with gravidity, parturition and puerperal time	80’945	69
Diseases of the respiratory system	71’789	55
Diseases of the nervous system	40’556	33
Endocrinology and metabolic diseases	14’986	51

TABLE 2. Treatment episodes in somatic specialised medical care in 2004 by frequencies and percentage share of urgent admissions according to some medical specialisms. STAKES 2006b.

Medical specialty	Treatment episodes, frequencies	Urgent admissions, %
Surgery	347’532	33
Internal medicine	241’802	63
Gynaecology and obstetrics	136’264	47
Paediatrics	58’266	62
Neurology	38’378	70
Pulmonary diseases and tuberculosis	38’556	42
Neurosurgery	9’907	37

IV

APPENDIX 4. TABLE 1. ED visits in 2004 by main diagnosis, top ten frequencies and percentage shares.

Main diagnosis	**ED visits, frequencies**	**Percentage share of all visits**
All cardiac diseases and symptoms	85'828	33.1
- of which:		
- Symptoms of cardiopulmonary organs	29'402	11.3
- Ischemic cardiac diseases (including angina pectoris, acute myocardial infarction, recurrent myocardial infarction, certain fresh complications of myocardial infarction, other acute ischemic cardiac diseases, chronic ischemic cardiac disease)	18'279	7
- Other cardiac diseases (including e.g. acute pericarditis, acute endocarditis, acute myocarditis, cardiac arrest, atrial fibrillation, conducting disturbances, cardiac insufficiency)	38'147	14.7
Symptoms of gastrointestinal track	47'312	18.3
General symptoms (including e.g. headache, fever of unknown origin)	32'632	12.6
Injuries of head (including e.g. superficial head injury, intracranial head injury, wounds of head)	27'258	10.5
Injuries of knee and crus	20'609	8
Injuries of wrist and hand	19'092	7.4
Intermittent / paroxysmal disturbances (including epilepsia)	13'744	5.3
Neoplasms	12'695	4.9

V

APPENDIX 5. TABLE 1. ED visits in 2004 by medical specialisms, top ten frequencies. STAKES 2006c.

Medical specialism	ED visits, frequencies
Surgery	270’902
Internal medicine	241’191
Gynaecology and obstetrics	87’205
Paediatrics	63’575
Neurology	45’428
General medicine	37’693
Ophthalmology	33’599
Oto- , rhino- laryngology	31’188
Pulmology	9’731
Neurosurgery	2’487

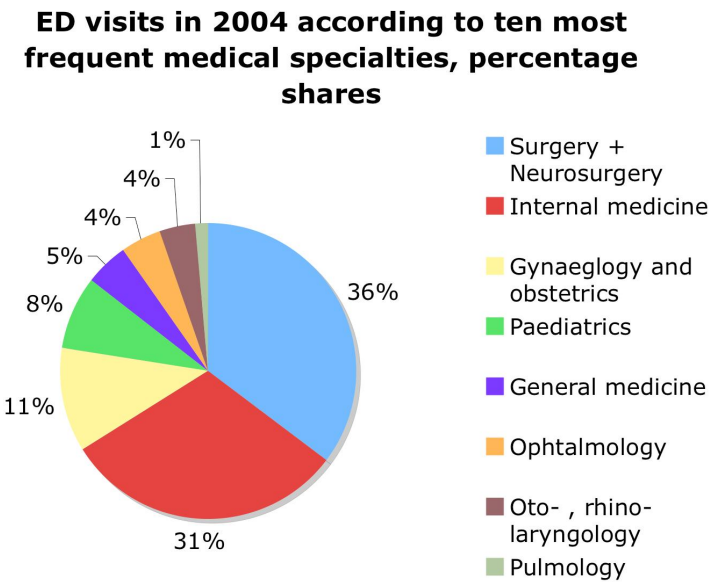
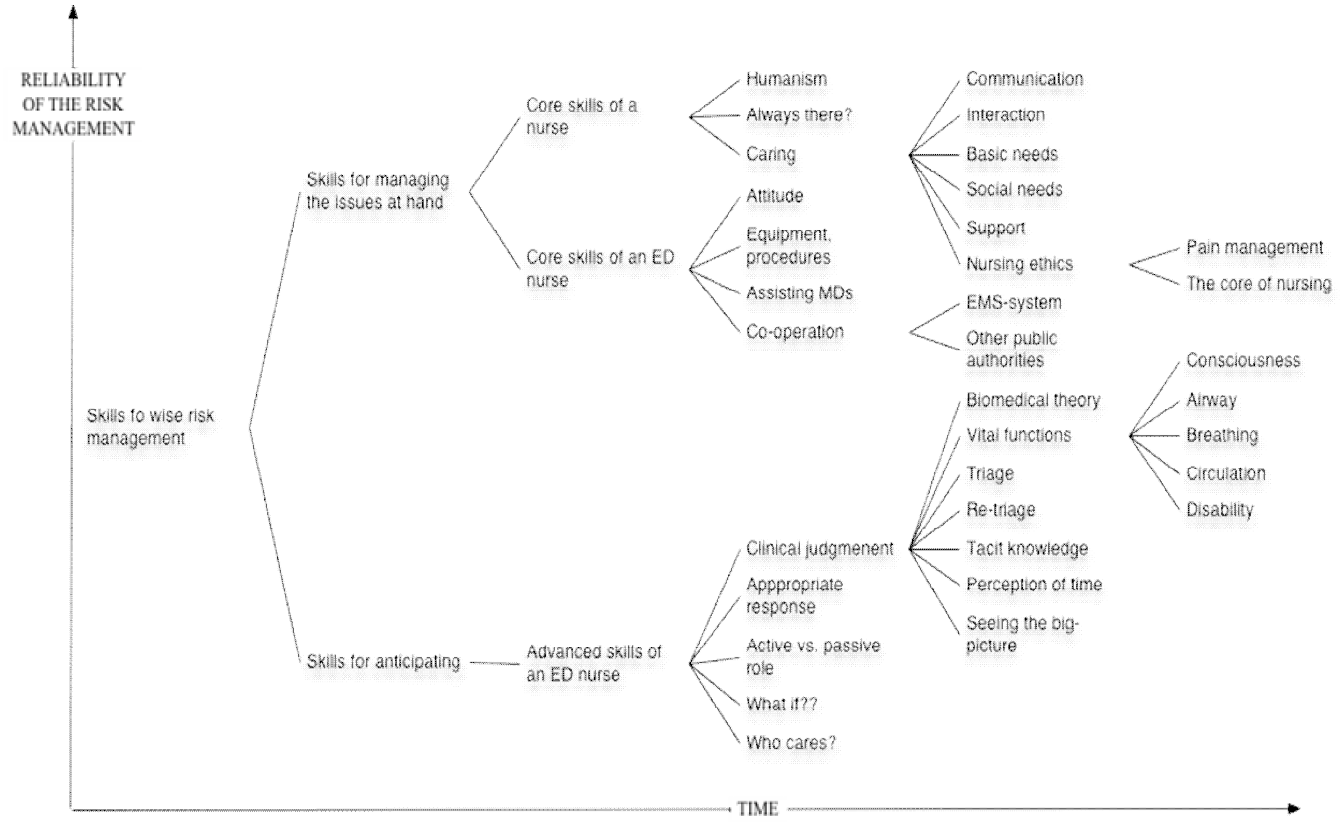


FIGURE 1. ED visits in 2004 according to ten most frequently used medical specialisms, percentage shares. STAKES 2006c.

VI

APPENDIX 6. FIGURE 1. A mind map of the issues raised from the final outcome of the I Delphi round.



VII

APPENDIX 7. TABLE 1. The matrix of interest groups and expertise.

Interest Groups / Field of expertise	The prevailing reality of ED nursing; ED nurses	The view of the progress of acute and emergency medicine = MDs from the field of acute and emergency medicine	The view of both local and central administration and economy; nurses in leadership position, administrative MDs, representatives of organisations, and bodies of the state	The view of the research, education and bystanders; the view of the progress of working environment and legislation
Specialists - Clinical skill	Cell A	Cell B	Cell C	Cell D
- A sub-specialized, sophisticated skill	Cell E	Cell F	Cell G	Cell H
The specialists of changing working environment = "general experts"	Cell I	Cell J	Cell K	Cell L

VIII

APPENDIX 8. TABLE 1. Factors describing the quality of ED nurses' clinical skills currently (items, KMOs, variance explained, loading with the factor, communality and Cronbach' s alpha).

Classification of the combined variables / *Factors* / *Name of the combined variable* / Statements included in the combined variable	KMO	Variance explained (percent)	Loading	Communality	Cronbach' s alpha
Clinical competence / competence assessment	.862	57.130			
Factor 2:Quality of the mastery of theoretical knowledge, equipment, and procedures					.857
- An ED nurse masters the theoretical knowledge			.683	.738	
- An ED nurse masters the equipment and devices for examining patients			.800	.787	
- An ED nurse masters the procedures			.655	.535	
Factor 1: Quality of the skill to assess patients' ability to breath and breathing load					.895
- An ED nurse can reliably assess the breathing load of patients			.720	.737	
- An ED nurse takes the respiratory rate of a patient into account as part of the assessment of respiration			.811	.773	
- An ED nurse counts patient' s respiratory rate as part of the assessment of respiration			.728	.590	
Factor 1:Quality of the mastery of biomedical theory					.825
- An ED nurse has the skill to interpret the result of a blood-gas sample adequately enough = recognizes hypoksemia, hyperkarbia, asidosis			.542	.374	
- An ED nurse has the skill to recognize an obvious ischemia from an ECG			.493	.566	
- An ED nurse has the skill to recognize haemodynamically significant cardiac arrhythmias from an ECG			.532	.621	
- An ED nurse masters the pharmacology needed in acute care well enough			.492	.453	
- An ED nurse knows the physiological and patho-physiological events that the equipment and devices, used for assessment and examination, are based on			.633	.540	

Appendix 8 continues.

	KMO	Variance explained (percent)	Loading	Communality	Cronbach' s alpha
Classification of the combined variables / *Factors* / *Name of the combined variable* / Statements included in the combined variable					
Caring and / or nursing role of an ED nurse					
Factor 3:Quality of the caring for the basic needs					.697
- An ED nurse takes care of the patients so that they do not have to experience pain needlessly			.528	.469	
- An ED nurse has the skill and will to take care of patients' basic care and social needs			.602	.403	
Factor 4: Quality of skills for pain management					.653
- An ED nurse recognizes patients' pain, but does not dare to treat it effectively			-.716	.520	
- An ED nurse recognizes patients' pain, but is not capable to treat it effectively			-.619	.464	
Caring and / or nursing role of an ED nurse	.765	63.746			
Factor 1: The quality of skills to co-operate with the EMS system					.828
- An ED nurse does not appreciate enough the work of pre-hospital EMS system			.673	.495	
- The oral reports of paramedics and EMTs are not listened carefully enough			.800	.678	
- The written documentation of paramedics and EMTs is not paid enough attention to			.816	.692	
Factor 2: The quality of skills to co-operate with other public authorities					.832
- An ED nurse has enough knowledge about the work of pre-hospital EMS system			.605	.486	
- An ED nurse has enough knowledge of the work of the dispatch centre for the co-operation to be fluent			.865	.774	
- An ED nurse has enough knowledge of the work of other public authorities (for example police, social welfare authority) for the co-operation to be fluent			.824	.699	

Appendix 8 continues.

	KMO	Variance explained (percent)	Loading	Communality	Cronbach' s alpha
Expanding the scope of an ED nurse' s practice	.796	45.788			
Factor 1: The quality of ability to take an active and independent role as an actor and developer					.715
- An ED nurse starts spontaneously to take care of patient' s vital functions, for example ventilating an inadequately breathing patient with a bag-valve mask			.550	.553	
- An ED nurse possesses an active approach to work as an independent nurse and a decision-maker			.654	.432	
- An ED nurse is able to lead a multiprofessional team well enough, when necessary			.590	.378	
- An ED nurse possesses enough tolerance and competence for change			.587	.346	
Factor 2:The quality of ability to resist expectations of a passive role of a nurse					.666
- An ED nurse waits for a MDs order for executing the procedures mentioned in statement 30			.568	.439	
- MDs take a negative attitude towards an ED nurse, who acts spontaneously, for example by starting the care for restoring or supporting patient' s vital functions			.600	.363	
- Other nursing staff in the ED take a negative attitude towards an ED nurse, who acts spontaneously, for example by starting the care for restoring or supporting patient' s vital functions			.752	.623	
ED triage	.607	56.861			
Factor 1: Quality of the skill to challenge the assessment of the triage-nurse					.756
- The assessment made by the triage-nurse is trusted excessively			.758	.600	
- The room-placement defined by the triage-nurse guides other personnel' s perceptions too much			.772	.633	
Factor 2: Quality of the assessment skills					.658
- The assessments of triage-nurses' are mainly correct			.707	.560	
- An ED nurse is capable of making a reliable clinical patient assessment without equipment			.687	.482	

Appendix 8 continues.

	KMO	Variance explained (percent)	Loading	Communality	Cronbach' s alpha
Clinical competence / competence assessment	.910	60.065			
Factor 1: Quality of the skills to assess the level of consciousness and to react accordingly					.909
- An ED nurse utilizes reliably the GCS for the assessment of patient' s level of consciousness			.717	.556	
- An ED nurse recognizes reliably patient' s obviously decreased level of consciousness			.698	.632	
- An ED nurse can reliably recognize patient' s decreasing level of consciousness			.707	.641	
- An ED nurse recognizes, based on GCS points, a situation, where a patient' s level of consciousness has decreased so much that his airway should be protected by intubation			.786	.725	
- An ED nurse recognizes reliably, based on patient' s reaction to painful stimulus, a situation, where patient' s level of consciousness has decreased so much that his airway should be protected by intubation			.758	.704	
- After recognizing, based on patient' s response to pain and/or GCS points, patient' s need to get intubated, the nurse promptly takes care of that this issue is informed to a MD that can take care of the intubation			.687	.586	
- An ED nurse recognizes reliably a situation, where a patient is exhibiting symptoms of acute cerebral stroke (and possible need of thrombolytic therapy)			.620	.543	
- An ED nurse pays adequately attention to information of patient' s incident and trauma mechanism			.409	.294	
Clinical competence / competence assessment					
Factor 2: Quality of the skills to recognize problems of respiration and circulation					.901
- An ED nurse recognizes reliably patient' s obvious respiratory insufficiency			.747	.648	
- An ED nurse recognizes reliably patient' s impending / latent respiratory insufficiency			.719	.633	
- An ED nurse can reliably assess patient' s circulatory status			.789	.715	
- An ED nurse recognizes reliably patient' s obvious circulatory insufficiency			.737	.639	
- An ED nurse recognizes reliably patient' s impending / latent circulatory insufficiency			.697	.622	
- An ED nurse recognizes a seriously ill patient among others			.536	.472	

IX

APPENDIX 9. TABLE 1. The matrix of variables in the futures' scenarios.

Scenario **Variables**	I "Business as usual"	II "ED nurse' s occupational profile is evolving"	III "The system in danger of collapsing"
1) The degree of centralisation of emergency health care services	Centralisation has been continued, but the pace has been clearly slowed down.	Heavy centralisation has been implemented.	An extremely heavy centralisation process has been implemented.
2) The overcrowding situations of EDs	Overcrowding occasionally, but the situation is mainly under control.	Structural and operational reforms have been implemented, and the overcrowding situations are more seldom.	The EDs left can' t handle the patient flows at all; waiting times exceed ten-twelve hours frequently.
3) The training of nurses working in the EDs	No special training program has been established.	Most ED nurses' have a candidate or master' s level training of clinical nursing; resembles the "Nurse practitioner" – competence.	Nurses' training has lost its appeal, and actual selection according to aptitude can' t be made – all applicants have to be recruited. EDs are run by insufficiently acquainted pensioners and hired personnel.
4) Independence of the nursing profession in the EDs	As was at the moment of inquiry.	A remarkable increase has occurred, an acute nurse' s profession has evolved; nurse' s receptions are an everyday routine within EDs.	Can' t be even talked about; more like a survival game. Tasks have had to be transferred to other groups of health care personnel from nurses.
5) Availability of nursing personnel	Some lack of work force exists, but a more liberal immigration politics has brought some relief to this.	EDs are magnet units, the turnover of nursing personnel has decreased essentially. The staff is waiting to get to work in the ED.	The turnover rate is unbearable; pensioners have been called back to work, and companies hiring nursing personnel are practically running EDs.

APPENDIX 9. continues.

6) Operational policies and models of action in the EDs	Central administration has ordered a triage nurse for the busiest times of day to make triage of incoming patients; otherwise as at the moment of inquiry.	Triage nurse is in every shift, nurse-led minor injuries and illnesses clinics within EDs are a routine, a nurse is entitled to set a medical work hypothesis, to prescribe within certain limits, and to write a certification for seven days sick-leave. Nurses' skills are regularly evaluated.	There are not enough nurses so that the triage nurse –policy would be possible; the amount of nurses in each shift is grossly insufficient; MDs and nursing management tries to survive from day to day.
7) The role of MDs in the ED	As at the moment of inquiry.	MDs are mainly focused in the care of more severely ill / injured patients; advisers and supervisors for nurses.	A mere survival game is going on also within the medical profession.
8) ED patient material	The amount of geriatric and patients suffering from substance-abusing problems have increased remarkably. Problems due to multi-resistant bacteria are a major issue.	The amount of geriatric and patients suffering from substance-abusing problems have increased remarkably. Methods of intensive care are applied routinely due to the slow outflow of patients.	Due to the extensive centralisation that has been implemented all kinds of patients are gathered to those few emergency health care units left; urgent and non-urgent patients as well as all age-groups and patients with different needs are waiting for their turn.
9) The state of patient satisfaction	Dissatisfaction has increased, complaints in terms of the quality and timing of the care are an everyday routine.	Patient satisfaction has increased, and complaints are received more seldom.	Patient satisfaction both in terms of their care and the whole health care system has collapsed severely. Malpractice complaints are

APPENDIX 9. continues.	continuously received. The non-functioning co-operation with primary care and social welfare administration aggravates this.

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