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PATIENT SECLUSION AND RESTRAINT PRACTICES IN PSYCHIATRIC HOSPITALS - TOWARDS EVIDENCE BASED CLINICAL NURSING

by

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To Raimo, Antti, Eveliina, Erika and my Mother Tyyne

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ABSTRACT

The overall goal of this study was to support evidence based clinical nursing regarding patient seclusion and restraint practices. This was done by ensuring professional competence through innovative learning methods. The data were collected in three phases between March 2007 and May 2009 on acute psychiatric wards. Firstly, psychiatric inpatients' experiences and suggestions for seclusion and restraint practices were explored (n=30). Secondly, nursing and medical personnel's perceptions of seclusion and restraint practices were explored (n=27). Thirdly, the impacts of a continuing vocational eLearning course on nurses' professional competence was evaluated (n=158).

Patients' perspectives received insufficient attention during the seclusion and restraint process. Improvements and alternatives to seclusion and restraint as suggested by the patients focused on essential parts of clinical nursing, but were not extensively adopted. Also nursing and medical personnel thought that patients' subjective perspective received little attention. Personnel proposed a number of alternatives to seclusion and restraint, and they expressed a need for education and support to adopt these in clinical nursing. Evaluation of impacts of eLearning course on nurses' professional competence showed no statistical differences between an eLearning group and an education-as-usual group.

This dissertation provides evidence based knowledge about the realization of seclusion and restraint practices and the impacts of eLearning course on nurses' professional competence in psychiatric hospitals. In order to improve clinical nursing the patient perspective must be accentuated. To ensure personnel's professional competence, there is a need for written clinical guidelines, education and support. Continuing vocational education should bring together written clinical guidelines, ethical and legal issues and the support for personnel. To achieve the ambitious goal of such integration, achievable and affordable educational programmes are required. This, in turn, yields a call for innovative learning methods.

Keywords: acute psychiatric ward, clinical nursing, continuing vocational education, eLearning course, patient perspective, professional competence, seclusion and restraint practices

Raija Kontio

POTILAIDEN ERISTÄMIS- JA SITOMISKÄYTÄNNÖT PSYKIATRISISSA SAIRAALOISSA – KOHTI NÄYTTÖÖN PERUSTUVAA KLIINISTÄ HOITOTYÖTÄ

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TIIVISTELMÄ

Tutkimuksen tavoitteena oli tukea näyttöön perustuvaa kliinistä hoitotyötä potilaan eristämis- ja sitomiskäytännöissä. Hoitotyötä tuettiin vahvistamalla henkilöstön ammatillista osaamista innovatiivisilla opetusmenetelmillä kuten verkkokurssilla. Tutkimusaineisto kerättiin akuuttipsykiatrian osastoilta kolmessa vaiheessa maaliskuun 2007 ja toukokuun 2009 välisenä aikana. Ensimmäisessä vaiheessa tutkittiin potilaiden (n=30) kokemuksia eristämis- ja sitomiskäytäntöihin ja heidän kehittämisehdotuksiaan. Toisessa vaiheessa tutkittiin hoitajien ja lääkärien (n=27) näkemyksiä ja kehittämisehdotuksia eristämis- ja sitomiskäytännöistä. Kolmannessa vaiheessa arvioitiin eristämis- ja sitomiskäytännöistä annetun verkkokurssin vaikutuksia hoitajien (n=158) ammatilliseen osaamiseen.

Tutkimuksessa potilaat kertoivat saavansa eristämis- ja sitomistilanteen aikana vain vähän huomiota. Potilaiden esittämät kehittämisehdotukset eristämis- ja sitomiskäytäntöihin sekä vaihtoehdot eristämiselle ja sitomiselle koskivat kliinisen hoitotyön keskeisiä alueita, mutta ne eivät toteutuneet käytännössä. Myös hoitajat ja lääkärit kuvasivat, että potilaat saivat tilanteissa vähän huomiota. Hoitajat ja lääkärit ehdottivat monia vaihtoehtoja eristämiselle ja sitomiselle sekä toivoivat koulutusta ja tukea kliiniseen hoitotyöhön. Verkkokurssin ja nykyisen koulutuskäytännön välillä ei havaittu tilastollisesti merkitseviä eroja.

Tämä väitöskirja tuottaa näyttöön perustuvaa tietoa eristämis- ja sitomiskäytännöistä sekä verkkokurssin vaikutuksista hoitajien ammatilliseen osaamiseen psykiatrisissa sairaaloissa. Kliinistä hoitotyötä kehitettäessä on erityisen tärkeää painottaa potilaan näkökulmaa. Henkilöstön ammatillisen osaamisen vahvistamiseksi tarvitaan kirjallisia ohjeita, koulutusta ja tukea. Ammatillisen täydennyskoulutuksen tulee yhdistää kirjalliset ohjeet, eettiset ja juridiset näkökohdat sekä henkilöstön tukeminen. Tämän kunnianhimoisen yhdistämistavoitteen saavuttamiseksi tarvitaan helposti saatavilla olevia ja edullisia koulutusohjelmia. Tämä puolestaan luo tarpeen innovatiivisille opetusmenetelmille.

Asiasanat: akuuttipsykiatrian osasto, kliininen hoitotyö, ammatillinen täydennyskoulutus, verkkokurssi, potilaan näkökulma, ammatillinen osaaminen, eristämis- ja sitomiskäytännöt

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ABBREVIATIONS

ANOVA	Analysis of variance
CI	Confidence Interval
CINAHL	Cumulative Index for Nursing and Allied Health Literature
CPT	The European Committee for the Torture and Inhuman or Degrading Treatment or Punishment
ERM	Early Recognition Method (a risk management strategy)
ES	Effect Size
ETENE	National Advisory Board on Health Care Ethics
GIN	Guidelines for International Network
HUS	Hospital District of Helsinki and Uusimaa
ICD-10	International Classification of Diseases, 10th Revision
ICN	International Council of Nurses
JDS	Job Diagnostic Survey
MANOVA	Multivariate analysis of variance
NICE	National Institute for Health and Clinical Excellence
OECD	Organisation for Economic Co-operation and Development
RCT	Randomized Controlled Trial
SD	Standard Deviation
SPSS	Statistical Package for the Social Sciences
S/R	Seclusion/Restraint
TERHIKKI	National Central Register of Health Care Professionals
VALVIRA	National Supervisory Authority for Welfare and Health
WHO	World Health Organization

LIST OF ORIGINAL PUBLICATIONS

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

I Kontio R., Joffe G., Putkonen H., Hane K., Kuosmanen L., Holi M. & Välimäki M. 2011. Seclusion and restraint in psychiatry: Patients' experiences and practical suggestions on how to improve practices and use alternatives. Perspectives in Psychiatric Care. In Press.

II Kontio R., Välimäki M., Putkonen H., Kuosmanen L., Scott A. & Joffe G. 2010. Patient restrictions: Are there ethical alternatives to seclusion and restraint? Nursing Ethics 17 (1), 65-76.

III Kontio R., Välimäki M., Putkonen H., Cocoman A., Turpeinen S., Kuosmanen L. & Joffe G. 2009. Nurses' and physicians' educational needs in seclusion and restraint practices. Perspectives in Psychiatric Care 45 (3), 198-207.

IV Kontio R., Lahti M., Pitkänen A., Joffe G., Putkonen H., Hätönen H., Katajisto J. & Välimäki M. 2011. Impact of eLearning course on nurses' professional competence in seclusion and restraint practices: A randomised controlled study (ISRCTN32869544). Journal of Psychiatric and Mental Health Nursing. Accepted.

1 INTRODUCTION

Every human being has the right to life, personal liberty, security and physical integrity (United Nations 1948, Finnish Constitutional Act 731/1999). Obviously, this also applies to psychiatric patients (Act on the Status and Rights of Patients 785/1992, European Charter of Patients' Rights 2002, Salize et al. 2002). In psychiatric care, however, there are situations in which patients may be hospitalised, controlled and treated against or regardless of their will (Mental Health Act 1116/1990, Putkonen & Völlm 2007). The use of patient restrictions, for example, involuntary admission, forced medication, seclusion and restraint is a complex ethical dilemma in psychiatric care (Niveau 2004, WHO 2005). These restrictions are linked to issues of an individual's right to self-determination, human rights and to the ethical responsibilities of mental health care personnel (Council of Europe 2000, Salize et al. 2002).

The most widely accepted reason for the use of patient restrictions (e.g. seclusion and restraint) is aggressive behaviour among patients potentially harmful to patients themselves or others (Whittington et al. 2009, Happell & Koehn 2010, Raboch et al. 2010). Evidence is still lacking regarding the effectiveness of seclusion and restraint in reducing patient's aggressive behaviour (Wright 2003, Nelstrop et al. 2006) or alleviating serious mental illnesses (Sailas & Fenton 2000). Seclusion and restraint are the harshest of these restrictions (Sailas & Fenton 2000, Happell & Harrow 2010) that are frequently harmful or traumatic to patients (Frueh et al. 2005, Keski-Valkama et al. 2010). Patients themselves have experienced seclusion and restraint as a punishment (Meehan et al. 2004, Keski-Valkama et al. 2010) or as a violation of their autonomy (Hoekstra et al. 2004) or even as a form of torture (Veltkamp et al. 2008). However, there are also in varying degree some positive experiences such as a feeling of safety or security or calming effect (Meehan et al. 2000, Kjellin et al. 2004). Some patients have seen seclusion and restraint as a part of the treatment of their aggressive and violent behaviour (Vartiainen et al. 1995, Repo-Tiihonen et al. 2004, Kuosmanen et al. 2007).

A number of practical and ethical dilemmas have emerged regarding patients' violence or threat of violence in health care, especially in psychiatry (NICE 2005, Duxbury et al. 2008, Kynoch et al. 2010). First, violence affects the physical and psychological health of personnel (Needham et al. 2005, Abderhalden et al. 2008). Second, the fear that results from working in a climate of potential danger can also undermine the patients' care (Farrell et al. 2006, Foster et al. 2007). An in-built conflict or ethical dilemma also exists related to patient violence: whether or not to seclude or restrain - both options entail drawbacks and benefits (Wynaden et al. 2002, Husum et al. 2008). Since both are in contrast to the personnel's feelings of professional, legal, ethical and personal responsibility to protect patients (Finnish Association of Nurses 1996, Finnish Association of Physicians 2005, ICN 2006), it may cause ethical stress (Lind et al. 2004, Moran et al. 2009). In addition, it is often difficult to weigh the best interests of a particular patient on the one hand against other people's best interests on the other (ICN 2006). Moreover, the current lack of structured and evidence based practices and guidelines increases pressure and ethical dilemmas among personnel (Huf et al. 2002,

Olofsson 2005, Kuosmanen et al. 2006, Bigwood & Crowe 2008). Furthermore, mental health nurses often express a positive attitude towards patient restrictions, e.g. seclusion and restraint have been perceived as treatment interventions for violent and aggressive patients (Husum et al. 2008).

Mental health care is an ethically sensitive field necessitating special competencies and caring approaches in clinical nursing (Välimäki et al. 2008, Björkdahl et al. 2010). This is even more important in the hospital setting, since psychiatric inpatients are particularly vulnerable to violation of their self-determination by patient restrictions like seclusion and restraint (Niveau 2004, WHO 2006). There is a clear need to train personnel to use novel and effective interventions in clinical practices and ensure that these interventions are a routine component of health care services (Means et al. 2009, Partanen et al. 2010). Training of personnel also plays a crucial role in reducing seclusion and restraint and improving practices (Schreiner et al. 2004, Sullivan et al. 2004, Smith et al. 2005, Bowers et al. 2006, Greene et al. 2006, Gaskin et al. 2007, Kynoch et al. 2010). The amount of personnel training focused on the care of patients with aggressive and severely disturbed behaviour has recently expanded (Farrell & Cubit 2005, Kynoch et al. 2010). The content and structure of such training, however, remain fragmentary. The need still exists to develop educational programmes to support mental health care personnel's professional competence to work in an ethically sensitive field. (Välimäki et al. 2008.) Moreover, there is a lack of knowledge on the effectiveness of training (Stewart et al. 2009) and the use of innovative learning methods, e.g. Internet-delivered education (eLearning) in psychiatric nursing (Heikkilä et al. 2005, Korkeila 2006).

The overall goal of the present study was to support evidence based clinical nursing in patient seclusion and restraint practices. This was done by ensuring professional competence with innovative learning methods. More specifically, the study focused on nursing personnel's continuing systematic vocational education and training based on patients' mental health care needs, changing clinical practices and personnel's educational needs (Finnish Statute of Continuing Vocational Education 1194/2003, §1). Through effective continuing vocational education it is possible to ensure personnel's professional competence, i.e. personnel's capacity to integrate knowledge, skills, attitudes and values required in clinical work (Epstein & Hundert 2002, Ministry of Finnish Social Affairs and Health 2002, 2004, Tilley 2008). The target group of the study comprised psychiatric inpatients who had experienced seclusion and/or restraint during their hospital stay on acute psychiatric wards and nurses and physicians working in psychiatric hospital setting. The primary target group was nursing personnel (including psychiatric nurses, mental health nurses, head nurses and assistant head nurses) who worked on acute psychiatric inpatient wards and participated in the intervention of this study.

This study is a part of the European Commission-funded research and development project (ePsychNurse.Net; Leonardo da Vinci; FI-06-B-F-PP-160701) being conducted in six European countries (Finland, England, Ireland, Italy, Lithuania, Portugal) and focusing on nurses' vocational training in the management of aggressive and disturbed psychiatric inpatients. In this European Commission project an eLearning course was

developed through a six countries collaboration involving academic institutions and health care providers (Välimäki et al. 2008). The eLearning course (ePsychNurse.Net) was evaluated in this study.

This study was conducted in the area of clinical nursing science. *Patient* is understood as an individual suffering from mental health problems (Specialized Medical Care Act 1062/1989, Pirkola & Sohlman 2005) who has been treated either voluntarily or involuntarily (Mental Health Act 1116/1990). The patient is considered an active participant in all phases of treatment to an extent depending his/her own resources to participate and make decisions (Jones & Meleis 1993, European Charter of Patients' Rights 2002). *Health* is understood as patients' self-reported mental condition or diagnosis or mental health professionals' evaluation of an individual's state of health. In this study, most of the patients suffered from severe mental health problems such as schizophrenia and related psychoses (WHO 2007a). In the context of psychiatric care, health has to be understood multi-dimensionally (Kaplan et al. 1994). *Nursing* is understood as the relationship between patient and nurse in psychiatric hospitals. Collaborative psychiatric nursing facilitates patient initiatives and allows patient's responsible participation in his/her care (Jones & Meleis 1993, Peplau 1997, Latvala 1998, Meleis 2006). The study *environment* is psychiatric hospitals on particular acute psychiatric wards were a part of a system of mental health services providing specialized medical care for people suffering from a medically diagnosed mental illness or other mental disorder (Specialized Medical Care Act 1062/1989, Mental Health Act 1116/1990).

2 OVERVIEW OF THE LITERATURE

2.1. Search of the literature

Earlier studies on the topic of the study were searched systematically and manually. In order to understand seclusion and restraint practices and the impacts of continuing vocational education in psychiatric hospitals an extensive literature search was conducted including the CINAHL, Cochrane Library and Ovid MEDLINE(R) databases. Database searches were conducted for the first time in October 2006 and the search included the period 1966-2006 (Appendix 1). These searches were updated in December 2010 using the same search history and search terms. The search history and search terms of Ovid MEDLINE(R) are described in Appendix 1. The same search terms were also used in CINAHL and Cochrane Library databases. The search regarding effectiveness or clinical trial of eLearning was conducted once in September 2009. Additionally searches were conducted in the net publishing databases of universities, the Internet by Google, and the www addresses of various organisations, such as ministries and the European Union. The titles of the articles were reviewed and the abstracts of the relevant articles were read. The whole article was read if the abstract contained relevant information on the topics of the study. The reference lists of the articles were also reviewed to find relevant publications. Literature searches were confined to studies published in English and in Finnish.

2.2. Mental health care in Finland

2.2.1. Mental health care and psychiatric services in Finland

In order to understand the present situation in Finnish psychiatric hospitals regarding patient restrictions and to delineate future directions (e.g. in educational programmes), it is essential to know the situation and environment of these patients and personnel today.

In Finland, mental health services should be organised according to the health care needs of the residents and sufficient treatment should be obtainable (Primary Health Care Act 66/1972 §14, subsection 2a, Specialised Medical Care Act 1062/1989 §3 and Mental Health Act 1116/1990, Chapter 1, §4). The municipalities (n=342) are responsible for arranging outpatient mental health care and rehabilitation services for their residents (Ministry of Social Affairs and Health 2004, Harjajärvi et al. 2006, National Institute for Health and Welfare 2010a, b). Outpatient care is the preferred form of treatment provided by health centres, mental health offices and outpatient clinics of psychiatric hospitals (Ministry of Social Affairs and Health 2004). Specialized mental health care is organised by hospital districts (n=21) and comprises inpatient services as well as some outpatient care services (Ministry of Social Affairs and Health 2005, National Institute for Health and Welfare 2010a). Public health

provision is supplemented by the private and "third sector" services (Harjajärvi et al. 2006). Involuntary treatment and seclusion and restraint may not be implemented in private services. Moreover, they can be applied only in public health institutions that meet certain prerequisites, e.g. there must be two or more physicians working in the hospital (Ministry of Social Affairs and Health 2005). One of the main challenges for the mental health care system is to reduce regional disparities in the quality and availability of services and to ensure comprehensive mental health planning at local levels (Ministry of Social Affairs and Health 2009, National Audit Office of Finland 2009).

In recent decades, the psychiatric care system has faced changes (Becker & Kilian 2006, Cottini & Lucifora 2010). Many countries have moved away from inpatient hospital care and developed out-patient services (Becker & Kilian 2006, OECD 2008, 2010). Since the early 1990s, such a shift has also occurred in Finland (Lehtinen et al. 2001, Ministry of Social Affairs and Health 2005). The number of psychiatric hospital beds in this country has shrunk from about 20, 000 beds in 1980 (Lehtinen et al. 2001) to 4, 500 in 2008 (National Institute for Welfare and Health 2010a). Correspondingly, the number of outpatient visits rose from 520, 000 in 1980 (Ministry of Social Affairs and Health 2005) to 1, 500, 000 in 2008 in specialized mental health care (primary and specialized mental health care together 2, 200, 000) (National Institute for Welfare and Health 2010a). In 2008, over 32, 000 (6.0/1000 inhabitants) patients were treated in psychiatric hospitals, with annual treatment days totalling 1, 644, 608. Of the patients, 51% were men. Patients aged 25-29 years were responsible for the majority of hospital treatment days. Of new patients, 31.8% were admitted to psychiatric hospital involuntarily (National Institute for Welfare and Health 2010a). Severe mental illnesses (in fact psychoses), were the main reason for the admissions to psychiatric inpatient hospital care (Lay et al. 2006). Of all treatment days, 55% were used for the treatment of schizophrenia (National Institute for Welfare and Health 2010a).

Mental health services in Finland are still more institution-oriented than those of other Nordic countries, with a higher rate of patient restrictions and lower availability of local services (Partanen et al. 2010). Finnish mental health services are guided with national programmes and guidelines, e.g. the Quality Recommendations for Mental Health Services (Ministry of Social Affairs and Health 2001) and the Plan for Mental Health and Substance Abuse Work (2009). The treatment and rehabilitation of patients is based on current care guidelines, e.g. Schizophrenia: Current Care Guideline (2008). The national Plan for Mental Health and Substance Abuse Work (Mieli 2009) requires a decrease of psychiatric inpatients beds to 3, 000 by 2015 if outpatient care is developed according to the plan's recommendations and also patient restrictions in psychiatric hospitals by 40% by 2015 (Ministry of Social Affairs and Health 2009). Enhancing service user expertise and peer support and developing psychiatric hospital care with increased patient security and simultaneous reduce of the use of patient restrictions is assumed to improve the status of patients (Kuosmanen 2009, Partanen et al. 2010). To achieve these aims the professional competence and ability of personnel to adopt the new principles and innovative methods of patient care are crucial (Partanen et al. 2010). Indeed, the existing programmes and guidelines recommend the enhancement of the professional competence of the personnel by education,

supervision and multiprofessional work and co-operation (Ministry of Social Affairs and Health 2009).

2.2.2. Mental health care personnel, professional competence and education in Finland

Mental health services are delivered by a number of professional groups including general practitioners, psychiatrists, psychiatric nurses, psychologists, social workers, public health nurses, occupational health nurses, occupational therapists and other experts (altogether 17 titles) (National Supervisory Authority for Welfare and Health 2010). The National Supervisory Authority for Welfare and Health (Valvira) grants the licences to and keeps a central register of health care professionals (Terhikki), which contains data on the right to practice a profession of over 300, 000 health care professionals (Pirkola & Sohlman 2005). The definition of and requirements for health care professionals are given in the Act (559/1994) and Decree (564/1994) on Health Care Professionals. The function of the Health Care Professionals Act is to promote patient security and quality of services. The law seeks to ensure adequate professional competence and capability of a health care professional. According to the Health Care Professionals Act, a health care professional is a person who has been granted the right to practice as a registered or licenced professional health care practitioner or a person who has the right to use the title of a health care professional (Ministry of Social Affairs and Health 2001).

There are two types of qualified nurses working in psychiatric institutions in Finland – registered nurses and practical nurses (e.g. mental health nurse) with respectively, 3.5 or 2.5 year training (Ministry of Education 2006, European Commission 2007). A qualified nurse in psychiatry takes care of the health and well-being of patients and supports them in managing daily health problems which are encountered as a result of their illness (Välimäki et al. 2008). Registered nurses tend to work in tasks that require taking more responsibility and autonomous decision-making. Practical nurses can work at certain basic tasks, most often providing general care in hospitals (Ministry of Education 2006). In Finland undergraduate (student nurse) education includes a few areas in management of distressed and disturbed patients and patient restrictions. These include nursing interventions and methods of rehabilitation, the therapeutic relationship and identification, assessment and support of a person and significant others in crisis. Education in the management of distressed and disturbed patients is mainly organized in continuing vocational education provision in each health care organization. (Välimäki et al. 2008). In Finland undergraduate education includes large areas in ethics. Throughout their training nurse students (both registered and practical nurses) have education in ethics. The main themes include ethics and moral, its' values and principles in nursing/health care, ethical principles of ETENE, ethical codes of registered nurses/practical nurses and their relevance in clinical nursing, professional development, identifing own and others' attitudes and views, ethical decision-making and ethical dilemmas (Ministry of Education 2006).

The number of registered nurses in Finland has increased from 56, 458 in 2002 (Stakes 2003) to 61, 035 in 2008. The number of qualified nurses, i.e. registered nurses and practical nurses in psychiatric hospitals in Finland dropped from 5, 399 in 1990 to 3, 984 in 2005 (Ailasmaa 2009). These decreases parallel the attrition in the number of psychiatric hospital beds. The number of qualified nurses has increased to 5, 110 in 2008 in psychiatric hospitals (Ailasmaa 2009) and the educational level of personnel has risen (WHO 2007b, Välimäki et al. 2008, Ailasmaa 2009). While the total health care expenditure shares in 2007 in Finland were slightly lower than the average in the OECD countries, professional personnel resources in psychiatric services were good (OECD 2008, 2010). Nevertheless, the existing services still fail to respond adequately to ever increasing needs of the population (Partanen et al. 2010). According to the report of the Ministry of Social Affairs and Health there has even been criticism that Finnish nurses' polytechnic education is too currently theoretical and fails to integrate into clinical nursing. Therefore, continuing vocational education is needed to fill the gap. (Uotila 2004.) There exists an increased pressure for the development of a mental health care delivery system able to offer a sufficient array of effective interventions (European Commission 2005, 2008, Cottini & Lucifora 2010). These interventions, in turn, indicate a development of matching professional competence of personnel, including that in psychiatric hospitals (Ministry of Social Affairs and Health 2009).

Professional competence of personnel is essential in ethically high-standard treatment (Finnish Association of Nurses 1996, Kisely et al. 2005, ICN 2006, Perraud et al. 2006). It means the habitual and judicious use of communication, knowledge, technical skills, clinical reasoning, emotions, values and reflection in daily practice for the benefit of the individual and community being served. Professional competence depends on habits of mind, including attentiveness, critical curiosity, self-awareness and presence and it is developmental, impermanent and context-dependent. (Epstein & Hundert 2002, Tilley 2008.) Mental health is an ethically sensitive field necessitating special competencies and caring approaches in clinical nursing (Välimäki et al. 2008, Björkdahl et al. 2010). This is even more important in the hospital setting, since psychiatric inpatients are particularly vulnerable to violation of their self-determination by patient restrictions like seclusion and restraint (Niveau 2004, WHO 2006).

Nurses' professional competence in psychiatry is crucial (WHO 2005). Physicians bear the main legal responsibility for patient care, including the decision-making on seclusion and restraint (Mental Health Act 1116/1990, Muraliharan & Fenton 2006). In reality, however, nurses are not only the key informants describing patients' clinical condition and the events preceding seclusion and restraint, but often the key-decision makers in seclusion and restraint (Janelli et al. 1995). Nevertheless, even qualified nurses may sometimes fail to appreciate the ethical implications of patient restrictions (Marangos-Frost & Wells 2000) though nurses' negative misconceptions and myths regarding patient restrictions can be powerful determinants of their behaviour (Suen et al. 2006). Continuing vocational education to improve employees' professional competence is thus urgently needed (Robertson et al. 2003, European Union 2009), otherwise the requirements of authorities (including those in Finland, Finnish Ministry of Social Affairs and Health 2009) to reduce the use of patient restrictions can be hardly met.

Professional competence is a major challenge in psychiatry because delivery of psychiatric and mental health services, the structure of organisations, treatment deliveries, demands for evidence based care, reduction in number of inpatient beds and length of in-patient hospital stay have changed dramatically in recent decades (Ward & Cowman 2007, Happel & Gough 2007). These changes require new types of professional competence, ability to adapt to new situations and innovative methods, which help patients to receive their care as effectively as possible (MacNeela et al. 2010). There is a clear need to train personnel to use novel and effective interventions in clinical practices and ensure that these interventions are a routine component of health care services (Schizophrenia: Current Care Guideline 2008, Means et al. 2009, Partanen et al. 2010). Finnish continuing vocational education (i.e. systematic education and training based on patients' health care needs, changing clinical practices and educational needs of personnel) has been provided for in the legislation in the Finnish Statute of Continuing Vocational Education (1194/2003, §1). The Act on Health Care Professionals (559/1994) also makes continuing vocational education/training mandatory. According to the Act, health care professionals are obliged to maintain and develop their professional knowledge and skills and must be acquainted with the rules and regulations relevant to their profession. Despite the occasional pressure resulting from insufficient personnel resources, it is the employer's statutory duty to enable employee's participation in educational programmes and training (The Act on Health Care Professionals 559/1994).

Effective continuing vocational education improves personnel's professional competence (Ministry of Finnish Social Affairs and Health 2002, 2004), well-being, job satisfaction and commitment to work (Docherty et al. 2005, Gilbody et al. 2006, Nolan & Bradley 2007, European Union 2009). It can support personnel's capacity to integrate knowledge, skills, attitudes and values in clinical work (Epstein & Hundert 2002, Tilley 2008). Moreover, it improves the clinical practices and the quality of patient care (Docherty et al. 2005, Gilbody et al. 2006, WHO 2006, European Union 2009). Numerous concerns persist about the effectiveness of continuing vocational education in health care services (Robertson et al. 2003, Means et al. 2009). First, continuing vocational education has seldom been integrated into organisations' strategic management. Second, employees' individual needs may be insufficiently taken into account. (Finnish Ministry of Social Affairs and Health 2004.) Third, teaching and learning methods may be inadequately considered. As Forsetlund et al. (2009) showed in a systematic review, interactive workshops, but not education sessions alone, may achieve moderately large changes in practice. Fourth, inadequate financing or shortage of qualified substitute personnel may prevent personnel from participating in educational programmes (Pentz et al. 2007). Therefore content, structure and quality of continuing vocational education should be examined carefully.

An adequately resourced and well-trained mental health care personnel is a prerequisite for providing ethically high-standard treatment. A variety of innovative methods ought to be explored in order to facilitate the systematic continuing vocational education of a high quality (Forsetlund et al. 2009) to increase personnel's professional skills in providing seclusion and restraint. This would both improve and maintain the quality of

patient care and boost the attractiveness of the work in psychiatric hospitals (Välimäki et al. 2008).

2.3. Patient seclusion and restraint practices in psychiatric hospitals

2.3.1. Patient seclusion and restraint practices

Seclusion refers to the isolation of a patient from other patients (Amendment to the Mental Health Act 1423/2001, Chapter 4a, section 22 §e). Most often patient has been isolated in a single, locked, unfurnished room where they can be monitored by nurses and from which they cannot leave at will (Sailas & Fenton 2000). Mechanical restraint refers to tying a patient onto a bed with bands and belts so that the patient cannot get up by him/herself. Bands and belts may be used around the body and/or upper and/or lower extremities. The details of using restraint bands and belts vary between hospitals as well as situations. (Sailas & Fenton 2000, Tuohimäki 2007.) Physical restraint includes situations when a patient is restricted by being held by the hands, arms and shoulders. Sometimes a patient is held by several nurses at the same time, and physical restraint is commonly used when a patient is being taken to a seclusion or restraint room. (Tuohimäki 2007.)

According to the Finnish national legislation (Mental Health Act 1116/1990, Chapter 2, §8) involuntary psychiatric hospitalisation is allowed when a patient 1) is suffering from mental health illness (a psychotic disorder), and 2) due to an illness he/she is in need of treatment so that lack of treatment would either a) result in serious deterioration of his/her condition or b) would seriously endanger his/her health or safety or c) would seriously endanger other people's health or safety, and 3) no other mental health services are suitable or sufficient to treat the patient. Seclusion and restraint can be used: a) as a last resort only when it is absolutely necessary to protect the patient's or others' safety; b) as safely as possible; c) with respect for the patient's human dignity; d) under the supervision of a physician (Mental Health Act 1116/1990, Amendment to the Mental Health Act 1423/2001, Chapter 4a, section 22 §e-f, Council of Europe 2004, Muraliharan & Fenton 2006), and e) only during statutory involuntary treatment or observation or investigation (Mental Health Act 1116/1990, Amendment to the Mental Health Act 1423/2001). It is essential that the restrictions are applied, when possible, within a context of mutual understanding between the patient and the personnel (Act of the Status and Rights of Patients 785/1992, Chapter 2, section 4a, European Charter of Patients' Rights 2002, Salize et al. 2002).

Seclusion and restraint are commonly used to treat and manage disruptive and violent behaviour (Sailas & Wahlbeck 2005, Whittington et al. 2009, Happell & Koehn 2010, Raboch et al. 2010). Keski-Valkama et al. (2009) have reported that psychotic behaviour is the most frequent reason for using patient restrictions even without any signs of potential violence, meaning that clinical practice deviates from the theoretical and legal ground established for patient restrictions. Often seclusion and restraint are used to control agitation or disorientation, too (Välimäki et al. 2001, Keski-Valkama et al. 2009). Seclusion and restraint are fraught with risks of various adverse effects, from

patients' deaths to deleterious physical and psychological effects for both the patient and the personnel (Sailas & Fenton 2000, Happell & Harrow 2010). In addition, evidence is still lacking regarding their effectiveness in reducing patient's aggressive behaviour (Wright 2003, Nelstrop et al. 2006) or alleviating serious mental illnesses (Sailas & Fenton 2000).

The European Committee for the Prevention of Torture and Inhuman or Degrading Treatment of Punishment (CPT) considers seclusion and restraint matters of particular concern given the potential for abuse and ill-treatment. Potential for abuse and ill-treatment is especially the care with mechanical restraint, which is thus justified only rarely, as a method of last resort (CPT 1997). But seclusion also contains potential for ill-treatment, especially in case of poorly ventilated seclusion premises, no means for the patient to contact the personnel, unsuitable bedding, lack of window glazing and deplorable sanitary conditions (Niveau 2004, CPT 2009).

In Europe, the rates of involuntary placements and patient restrictions in psychiatric care vary remarkably (Sailas & Fenton 2000, Salize & Dressing 2004, Martin et al. 2007, Keski-Valkama 2010). Finland is one of the countries that relatively overuses involuntary placement with a rate of 218/ 100, 000 population (Salize & Dressings 2004). Finland has been ranked average (Keski-Valkama 2010, Raboch et al. 2010) or above average (Tuohimäki 2007) according to preliminary international seclusion and restraint statistics. Comparing seclusion and restraint rates internationally is difficult due to different definitions of seclusion and restraint and differences in patient populations studied (Keski-Valkama et al. 2007). In 2008, out of 32, 140 patients treated in psychiatric inpatient care, patient information related involuntary treatment was obtaining on 29 875. Of these, 2, 016 patients (6.7 %) had been secluded in a room, 1, 054 patients (3.5 %) had been mechanically restrained and 502 patients (1.7%) had been physically restrained. The numbers for the use of seclusion and restraint have slightly decreased within recent years. (National Institute for Welfare and Health 2010.) On the other hand, methods used to register patient restrictions are advanced and widely used in Finland, which is not the case in all countries (Keski-Valkama et al. 2007).

There is indubitably a need for randomised trials, which means randomisation of hospital wards to either implement preventive interventions or implement practice as usual, to assess the effectiveness of prevention programmes to reduce the use of seclusion and restraint (Sailas & Wahlbeck 2005, Nelstrop et al. 2008, Kuosmanen 2009, Kynoch et al. 2010). First, there is a need for novel and effective methods to address violence and threatened violence on psychiatric wards (Sailas & Wahlbeck 2005, Gaskin et al. 2007, Nelstrop et al. 2008). Second, personnel needs education to implement these novel and effective methods (Schizophrenia: Current Care Guideline 2008, European Union 2009, Kynoch et al. 2010). Third, there is a need for patient perspective and service user involvement in the development of inpatient aggression management programmes in psychiatry (Sailas & Wahlbeck 2005, Ministry of Social Affairs and Health 2009).

2.3.2. Patients' experiences and suggestions for seclusion and restraint practices

A variety of patients' experiences and suggestions have been documented regarding seclusion and restraint practices in psychiatric hospitals. Patient perspective and service user involvement are essential parts of the planning and delivery of health care (Council of Europe 2000, Howard et al. 2003) and in psychiatry in the development of inpatient aggression management programmes (Ministry of Social Affairs and Health 2009).

Some patients' experiences of seclusion and restraint are negative, harmful or traumatic (Bonner et al. 2002, Frueh et al. 2005). Many patients do not know the reason for their seclusion and restraint (Meehan et al. 2004) and have experienced seclusion and restraint as a punishment (Holmes et al. 2004, Meehan et al. 2004, Keski-Valkama et al. 2010) or as a violation of their autonomy (Hoekstra et al. 2004) or even as a form of torture (Veltkamp et al. 2008). Seclusion and restraint used in the management of aggression and violent behaviour may undermine patient satisfaction (Kuosmanen et al. 2006) as well as treatment compliance (Jenkins et al. 2002). The opinions of mechanically restrained patients tended to be even more negative (Wynn 2004). Seclusion and restraint-related negative emotions often mentioned by patients are anger, helplessness, powerlessness, confusion, loneliness, desolation and humiliation (Hoekstra et al. 2004). Negative feelings due to perceived lack of interaction with the personnel before, during and after seclusion and restraint are common (Meehan et al. 2000, Keski-Valkama et al. 2010). However, there are also varying degree of positive experiences such as a feeling of safety or security or calming effect (Meehan et al. 2000, Kjellin et al. 2004). Some patients see seclusion and restraint as a part of the treatment of their aggressive and violent behaviour (Vartiainen et al. 1995, Repo-Tiihonen et al. 2004, Kuosmanen et al. 2007).

Patients' suggestions for improving of seclusion and restraint practices have been related to poor interaction with personnel, few activities, compulsory medication and dismal environment (Meehan et al. 2000, Kuosmanen et al. 2006, Keski-Valkama et al. 2010). Patients have expressed a need for more interaction with nurses and physicians and wanted nurses to respect their autonomy as much as possible in the process of seclusion and restraint (Olofsson & Nordberg 2001). Patients have also provided practical suggestions on how to improve the use of patient restrictions: the option to use toilet facilities and take care of their hygiene, more comfortable bed and bedclothes, smoking provisions, more therapeutic furnishing, alarm bell, and ordinary clothing (Keski-Valkama et al. 2010). It has been suggested that nursing personnel should support patients' autonomy and, when feasible, let them make their own decisions at least in ostensibly minor matters, such as deciding which clothes to wear or what to eat or drink (Hoekstra et al. 2004, Kuosmanen et al. 2007) or when go to the toilet or shower (Keski-Valkama et al. 2010). Patients wanted the personnel to talk to them and to show genuine interest during seclusion and restraint (Moran et al. 2009). Moreover, patients expressed a need to discuss the seclusion and restraint event and their feelings afterwards (Ryan & Happell 2009, Keski-Valkama et al. 2010, Needham & Sands 2010).

Patients have been asked about their own proposals for alternative methods, but data on these are scarce (Meehan et al. 2000, Keski-Valkama et al. 2010). Patients themselves have suggested less restrictive alternatives to seclusion and restraint, e.g., one-to-one verbal intervention followed by medication, constant observation, use of the psychiatric intensive care unit, a "time out" programme, an opportunity to negotiate with personnel (Meehan et al. 2000), activities, relaxing music and better explanation of ward rules (Keski-Valkama et al. 2010).

In recent years, patients have been increasingly encouraged to take a more active role in the planning and delivery of health care (Council of Europe 2000). In psychiatry, too, a number of measures have been undertaken to strengthen the position of patients (European Commission 2005). The importance of the patient's perspective and service user involvement in the development of inpatient aggression management programmes has been recognized (Ministry of Social Affairs and Health 2009). To ensure evidence based patient-centred psychiatric services, patients' experiences and practical suggestions on the improvement of seclusion and restraint practices and alternatives are essential (Hyde et al. 2009, Kuosmanen 2009, Keski-Valkama 2010).

2.3.3. Health care personnel's perceptions of seclusion and restraint practices

Seclusion and restraint are emotionally distressing and ethically problematic for the mental health care personnel (Marangos-Frost & Wells 2000, Lind et al. 2004, Schlafani et al. 2008, Keski-Valkama et al. 2010). Seclusion and restraint are associated with fear, shame and distress as well as concern over abusing patients' rights (Bonner et al. 2002, Jonker et al. 2008, Mason et al. 2009, Moran et al. 2009). Personnel typically wish to develop a therapeutic relationship with their patients (Bergum & Dossetor 2005, Fluttert et al. 2008, 2010). At core this is usually perceived as a basic ethical relationship of trust between the nurse or physician and the patient. This relationship can easily be undermined by the use of seclusion or restraint (Rumbold 1999, Roberts 2005, Husum et al. 2008, Moran et al. 2009.)

Personnel itself has often perceived seclusion and restraint as beneficial to the patient – an attitude that has changed little in the past few years (Sailas & Wahlbeck 2005). Moreover, they also tended to believe that seclusion and restraint are used correctly (Wynn 2003), which may reflect attitudinal adjustment to prevailing practices (Bowers et al. 2007, Whittington et al. 2009). Personnel and patients may have differing perceptions of the effects of seclusion and restraint on patients' well-being and this inconsistency may result from a lack of collaboration between personnel and patients (Foster et al. 2007). The personnel assert that seclusion and restraint are necessary for safety and have therapeutic value devoid of punitive connotation, whereas patients consider seclusion and restraint to be forms of punishment devoid of therapeutic value (Heyman 1987, Brown & Tooke 1992, Wynaden et al. 2001, Meehan et al. 2004). Personnel and patients disagree about whether or not the use of seclusion and restraint is beneficial (Keski-Valkama 2010).

The existing significant variation in the use of seclusion and restraint within and between Western countries has not been fully explained (Sailas & Fenton 2000, Salize

& Dressing 2004, Martin et al. 2007, Keski-Valkama 2010, Raboch et al. 2010). A common assumption is that local culture and personnel attitudes to patient restrictions influence personnel behaviour (Kullgren et al. 1996, Wynn & Bratlid 1998, Zinkler & Priebe 2002, Cashin et al. 2010). Husum et al. (2008) found three mental health care personnel's attitudes to patient restrictions, seclusion and restraint as: 1) offensive and harmful towards patients and likely to violate the relationship between caregiver and patient (critical attitude), 2) offering care and security (pragmatic attitude), where seclusion and restraint are not considered to be positive or wanted, but necessary for safety and security reasons, 3) a treatment intervention (positive attitude). This positive attitude is a common assumption in the mental health nursing literature, though in contains a strong element of paternalism. (Husum et al. 2008.) Nevertheless, in everyday clinical practice the pragmatic attitude, although extremely seldom needed in acute psychiatry, cannot be absolutely discouraged.

Mental health care personnel has proposed alternatives to seclusion and restraint, such as treatment plan improvements, increased personnel to patient ratios, psychiatric emergency response teams, pharmacological interventions, and changing the therapeutic environment (Foster et al. 2007). However, the implementation of these alternative methods has apparently been insufficient (Gaskin et al. 2007). Treating patients as active participants included: discussing the goal and positive outcomes of the seclusion and restraint reduction or therapeutic de-escalation strategies or ward rules with the patients (Mistral et al. 2002, Schreiner et al. 2004). In consultation with patients, clinicians created a patient violence tool, which includes details on the relevant histories of patients and precipitants to their violence; data on how patients tended to display agitation, aggression and violence; and interventions that patients might find useful in case of loss of self-control (Sullivan et al. 2005, Gaskin et al. 2007). For example, in applying the Early Recognition Method (ERM), nurses teach patients how to explore and describe their personal early signs of violence. The patient and nurse evaluate the patient's behaviour systematically to recognize the warning signs at an early stage. When warning signs are observed, nurses encourage patients to carry out preventive actions to stabilize their behaviour. In ERM trainings, nurses learn to prolong a balanced, nonjudgmental attitude toward patients. (Fluttert et al. 2008, 2010).

Improvements in personnel to patient ratios by decreasing the number of patients and increasing the number of personnel per unit were part of the agenda for change. This change contributed to personnel being able to provide more sensitive care than they had been able to give in the past and to a safer environment for both personnel and patients. (Donat 2003, Smith et al. 2005.) There were also hospitals where personnel introduced a psychiatric emergency team for behavioural emergencies. To become a member of these teams, personnel participated in additional training to enhance their skills to manage crisis situations in ways where they refrain from using restrictive procedures, To defuse crisis situations, personnel primarily used de-escalation with their verbal violence prevention skills, therapeutic communication, mediation and conflict resolution. (D'Orio et al. 2004, Smith et al. 2005, Hellerstein et al. 2007.)

Legislation and a range of rules, regulations and recommendations on the use of seclusion and restraint have been developed in most Western countries, but by themselves they have not had any impact on the use of patient restrictions (Keski-Valkama et al. 2009, Steinert & Lepping 2009). The lack of a corresponding desirable change in the use of seclusion and restraint could, however, also be explained by the concentration of ever more difficult-to-treat patients in psychiatric hospitals due to contemporary deinstitutionalisation (Repo-Tiihonen et al. 2004). E.g. in Finland the number of psychiatric hospital beds shrank from 20 000 to 4 500 after 1980 (Lehtinen et al. 2001, National Institute for Welfare and Health 2010a). Whatever were the reasons for the unchanged seclusion and restraint statistics, their figures still vary by countries and regions and **c**linical practices remain heterogeneous. So far, there remains a lack of structured, evidence based practices and guidelines regarding violent and aggressive patients' care, the use of patient restrictions and alternative methods (Marangos-Frost 2000, Olofsson & Nordberg 2005, Kuosmanen et al. 2006, Steinert & Lepping 2009, Keski-Valkama 2010).

2.3.4. Methods to support mental health care personnel's professional competence in seclusion and restraint practices

There are different methods to support mental health care personnel's professional competence in seclusion and restraint practices. Reducing the rates of seclusion and restraint and to improve practices is challenging and generally requires personnel to implement several interventions systematically (Huckshorn 2004, 2007, Bowers et al. 2006, Gaskin et al. 2007, Doeselaar et al. 2008). The common features of the programmes for change in seclusion and restrain rates and practices were leadership, monitoring seclusion and restraint episodes, changing the therapeutic environment and personnel education (Huckshorne et al. 2005, Gaskin et al. 2007, Aschraft & Anthony 2008, Scancan 2010). No randomized controlled trials (RCT) have been conducted to show if any other less restrictive intervention would be more effective or efficient than seclusion and restraint to prevent or manage patient aggression (Berkg et al. 2008).

Leadership has some impact on the design, implementation and monitoring of all interventions. Several authors have described some of the leadership behaviours contributing to organisational changes. (Gaskin et al. 2007.) External to psychiatric facilities, chief psychiatrists and community advocates for psychiatric patients can influence the policies and practices of those facilities (Smith et al. 2005). Internally, the management of these facilities was involved in setting new expectations for personnel to reduce the use of seclusion and restraint (Sullivan et al. 2005, Scancan 2010), reviewing seclusion and restraint policies (Fisher 2003a) publicly advocating for seclusion and restraint reduction (Fisher 2003b, Sullivan et al. 2005), changing systems of practice to make seclusion and restraint reduction a priority (Schreiner et al. 2004), introducing an audit tool to collect information on each seclusion and restraint episode (Taxis 2002) and modelling crisis de-escalation techniques (Schreiner et al. 2004).

Data on episodes of seclusion and restraint have been collected by psychiatric institutions and used for clinical, educational, managerial and publicity purposes (Taxis

2002, Donat 2003, Donovon et al. 2003, Fisher 2003a, b, Schreiner et al. 2004, Smith et al. 2005, Hellerstein et al. 2007). Management used these data to identify both general seclusion and restraint patterns and outlier patients (Schreiner et al. 2004). Data on general patterns were used to facilitate interhospital comparison of the use of seclusion and restraint (Smith et al. 2005), to enable performance to be compared with ward and hospital goals (Donovon et al. 2003) and to inform the development of personnel education programmes (Taxis 2002). Post-event analyses were a further method by which seclusion and restraint episodes were monitored (Fisher 2003a). All episodes of seclusion and restraint were made subject to post-event analyses, which personnel involved in the seclusion and restraint, along with their supervisors (Fisher 2003b). The focus of these analyses was on ascertaining how personnel handled the events, on what personnel could have done differently to avoid placing patients in seclusion or restraints, and on developing plans to try to prevent such episodes from recurring (Fisher 2003a, Needham & Sands 2010).

Making changes to the therapeutic environment has been a common way in which personnel at psychiatric institutions tried to reduce seclusion and restraint rates (Taxis 2002, Fisher 2003, D'Orio et al. 2004, Schreiner et al. 2004, Sullivan et al. 2004, Smith et al. 2005, Bowers et al. 2006, Greene et al. 2006). Personnel adopted new therapeutic frameworks to guide practice, e.g. a collaborative problem-solving approach (Greene et al. 2006) or a working model for the development of high-therapy, low-conflict psychiatric wards (Bowers et al. 2006). In addition, personnel at an adult psychiatric service shifted their treatment paradigm from one of personnel fear and control to one of patient empowerment and collaborative relationships (Sullivan et al. 2005). Personnel at some facilities improved the therapeutic environments by increasing the frequency with which they communicated with the patients about their needs (Sullivan et al. 2004) and their care (Mistral et al. 2002). On a daily basis on one ward personnel assessed patients' mental states and their risks of committing violent or harmful acts to themselves or others. These assessments were used in the development of 24-hour individual service plans for patients. (Sullivan et al. 2004.)

Education of personnel is central to the efforts of many organisations to reduce seclusion and restraint (Fisher 2003, D'Orio et al. 2004, Schreiner et al. 2004, Sullivan et al. 2004, Smith et al. 2005, Bowers et al. 2006, Greene et al. 2006, Gaskin et al. 2007, Hellerstein et al. 2007, Livingston et al. 2010). In these studies the rates (both numbers and hours) of seclusion and restraint were reduced during or after the educational intervention. Education of personnel is also important to prevent and manage patient aggression (Arnetz & Arnetz 2000, Deans 2003, Grenyer et al. 2004, Laker et al. 2010). In these studies the adverse outcomes (violence and aggression incidents or fights or assaults or elopements) were reduced during or after the educational intervention. Education has typically been focused on two main areas: the implementation of new models of care and alternative behavioural interventions to seclusion and restraint. New models of care came from the authors' work on the development of high-therapy, low-conflict wards (Bowers et al. 2006) or on collaborative problem-solving (Greene et al. 2006). Education in alternative behavioural interventions tended to have several components: 1) to identify the behavioural indicators of impending violence, 2) to collaborate with others and to use

verbal de-escalation techniques (Bigwood & Crowe 2008), 3) to intervene in a crisis, 4) to employ diversional activities, 5) to consider the ethics involved in seclusion and restraint, 6) to improve documentation skills, 7) to apply therapeutic interventions on patients with personality disorders, and 8) the use of medications of aggressive patients (Huf et al. 2002, Taxis 2002, Knott et al. 2006, Pratt et al. 2008). Some of this education occurred in one-to-one discussion and during problem-solving exercises. Personnel at this facility also used information gained through their evaluations of seclusion and restraint episodes to design targeted education to address areas of concern. (Gaskin et al. 2007.)

Education alone is insufficient to change nurses' attitudes or behaviour and it needs to be accompanied by more extensive organisational changes especially in acute inpatient facilities (Bowers et al. 2006, Duxbury et al. 2008, Kynoch et al. 2010). The promotion of therapeutic relationships is necessary if aggression is to be handled more effectively (Duxbury 2002), whilst this clearly involves revisiting policies and education strategies, it must also address philosophies of care, organizational cultures and national influences (Curran 2007, Duxbury et al. 2008).

Internet-delivered education (eLearning) is a promising method to foster basic education and continuing vocational education in health care (Wutoh et al. 2004, Meyer et al. 2009). Yet it has not been used in psychiatric nursing related to aggressive and violent patients care or patient restrictions. eLearning enables simultaneous use of different learning techniques (Cobb 2004) and tailoring learning to satisfy students' personal objectives (Ruiz et al. 2006). It increases students' own control over the content, place and time of learning (Cook et al. 2010). Furthermore, eLearning increases students' self-efficacy (Docherty et al. 2005) and satisfaction with education (Cook et al. 2008), helping students gain knowledge, skills, and improved attitudes faster than with traditional instructor-led methods (Cook et al. 2008). eLearning can yield significant cost-savings through reduced instructor training time, travel and labour costs, mitigated institutional infrastructure and easiness of expanding the educational programmes (Ward et al. 2008). However, no data is available on eLearning in psychiatric nursing regarding the care of aggressive and violent patients (Korkeila 2006). There is an obvious need to identify novel and effective methods to treat violence and aggressive behaviour on psychiatric wards (Sailas & Wahlbeck 2005, Gaskin et al. 2007). eLearning may be a promising method to ensure the personnel's professional competence to implement novel and effective methods (Meyer et al. 2009).

2.4. Summary of the overview of the literature

In recent decades, the psychiatric care system has faced changes. The number of beds in psychiatric hospitals has decreased and hospitalisation has been replaced by outpatient services. Treatment periods in psychiatric hospitals have become shorter, and the few hospital beds should be kept in use as effectively as possible. Finland is one of the countries that relatively overuse involuntary placement and has been ranked average or above average according to international seclusion and restraint statistics.

Psychiatric patients' experiences of seclusion and restraint are mainly negative, harmful or traumatic. Patients' suggestions regarding the improvement of seclusion and restraint practices have been related to poor interaction with personnel, few activities, compulsory medication and dismal environment. Patients have also been asked about their own proposals for alternative methods, but these data are scarce.

The use of seclusion and restraint is emotionally distressing and ethically problematic for the mental health care personnel. They have proposed alternatives to seclusion and restraint but the implementation of these alternative methods has apparently been insufficient. Reducing the rates of seclusion and restraint and improving practices is challenging and generally requires personnel to implement systematically several interventions.

Mental health is an ethically sensitive field necessitating special competencies and caring approaches in clinical nursing. This is even more important in the hospital setting, since psychiatric inpatients are particularly vulnerable to violation of their self-determination by patient restrictions. Physicians have the main responsibility for patient care and decision making on seclusion and restraint. In reality, however, nurses are not only the key informants describing patients' clinical condition and the events preceding seclusion and restraint, but often the key decision-makers on seclusion and restraint. Thus, nurses' professional competence in psychiatry is crucial. Continuing vocational education to improve employees' professional competence is thus urgently needed, otherwise the requirements of authorities to reduce the use of patient restrictions can be hardly met.

The education of personnel is central to the efforts of many organisations to reduce seclusion and restraint. Education has focused on two main areas: the implementation of new models of care and alternative behavioural interventions to seclusion and restraint. eLearning is a promising method to foster continuing vocational education in health care. It enables simultaneous use of different learning techniques and tailoring learning to satisfy students' personal objectives. No data is available on eLearning in psychiatric nursing regarding the care of aggressive and violent patients or patient restrictions.

Earlier research reveals a need for novel and effective methods to address violent and aggressive behaviour of patients on psychiatric wards. Personnel need education to implement these effective methods. Moreover, there is a need for the patient perspective in the development of inpatient aggression management programmes in psychiatry. The impacts of continuing vocational education (e.g. innovative learning methods, such as eLearning) on personnel's professional competence in seclusion and restraint practices should be evaluated in psychiatric nursing.

3 AIMS OF THE STUDY

The overall goal of the study was to support evidence based clinical nursing regarding patient seclusion and restraint practices. This was done by ensuring professional competence through innovative learning methods. The study adopted the following three aims:

1. To describe psychiatric inpatients' experiences and suggestions regarding seclusion and restraint practices in psychiatric hospitals (Paper I)
2. To describe nursing and medical personnel's perceptions of seclusion and restraint practices in psychiatric hospitals (Paper II, III)
3. To evaluate the impact of continuing vocational education on nurses' professional competence in seclusion and restraint practices (Paper IV)

More specifically, the following phases and research questions of this study were:

PHASE I: Psychiatric inpatients' experiences and suggestions for seclusion and restraint practices in psychiatric hospitals

1. What kind of experiences do patients have of seclusion and restraint? (Paper I)
2. What kind of suggestions do patients have on how to reduce the use and improve practices of seclusion and restraint? (Paper I)
3. What kind of alternatives do patients prefer to seclusion and restraint? (Paper I)

PHASE II: Nursing and medical personnel's perceptions of seclusion and restraint practices in psychiatric hospitals

1. What actually happened when a patient became aggressive on a ward? (Paper II)
2. What alternative methods did nurses and physicians apply instead of seclusion and restraint on a ward? (Paper II)
3. What was the mode of action for aggressive and disturbed patients on a ward from the perspective of nurses and physicians? (Paper III)
4. What kind of education and support would nurses and physicians have liked to have in relation to the management of aggressive and disturbed patients? (Paper III)

PHASE III: Impact of continuing vocational education on nurses' professional competence in seclusion and restraint practices

1. What are the impacts of an eLearning course (ePsychNurse.Net) on nurses' knowledge on coercion-related legislation, on physical restraint and seclusion, attitudes towards physical restraint and seclusion, job-satisfaction and general self-efficacy? (Paper IV)

In this phase the following hypotheses were addressed:

H0: There are no differences in nurses' knowledge on coercion-related legislation, physical restraint and seclusion, attitudes towards physical restraint and seclusion, job-satisfaction and general self-efficacy between different education groups (intervention group: eLearning course and control group: education-as-usual).

H1: The primary hypothesis: those nurses completing the ePsychNurse.Net course (intervention group) are better informed on coercion-related legislation, physical restraint and seclusion than their counterparts undergoing conventional training (control group).

The secondary hypotheses: the intervention group would demonstrate a less tolerant attitude towards physical restraint and seclusion, and higher job satisfaction and general self-efficacy than the control group.

4 METHODOLOGY

4.1. Methodological approaches and design

This study is intended to support evidence based clinical nursing in patient seclusion and restraint practices by ensuring professional competence with innovative learning methods. The work was carried out in three phases (Figure 1) between March 2007 and May 2009 among psychiatric inpatients, nursing and medical personnel in two hospital districts, three hospitals and 12 acute closed psychiatric inpatients wards. In Phase I psychiatric inpatients' experiences and suggestions of seclusion and restraint practices in psychiatric hospitals were explored. In Phase II nursing and medical personnel's perceptions of seclusion and restraint practices in psychiatric hospitals were explored. The data of phases I and II were analysed in 2007 and the results were used in developing the content and methods of eLearning course in 2008 on the European Commission project ePsychNurse.Net. Including both patients' and personnel's perspectives yields the most complete picture of the phenomenon in its context (Foss & Ellefsen 2002). In Phase III, the eLearning course (ePsychNurse.Net) was evaluated from the perspective of nursing personnel's professional competence.

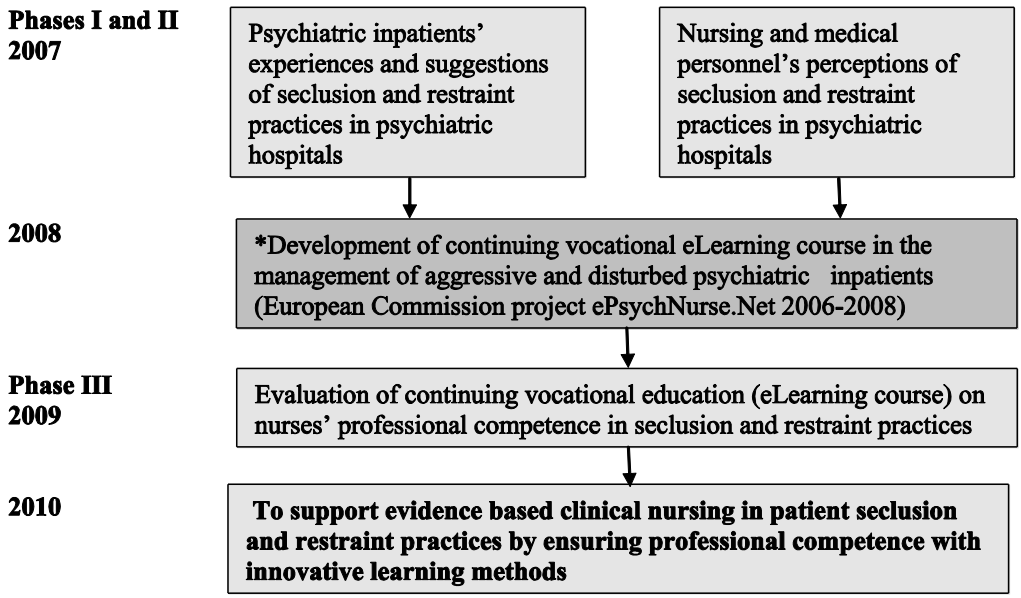

Figure 1. Phases, timing and overall goal of the study
*(*Development of continuing vocational eLearning course did not include to the dissertation)*

In **Phases I and II**, a descriptive approach and an explorative qualitative study design was used because little was known about the topic of interest and respondents' own accounts and descriptions were in focus (Morse 1991, Bowling 2004). Qualitative research methods are appropriate when exploring social and sensitive phenomena as

perceived by the individuals themselves (Denzin & Lincoln 2000, Burns & Grove 2005). Results from Phases I and II were used to develop the eLearning course in collaboration between six European counties on the European Commission project ePsychNurse.Net. Different methods of data collection and analysis at different phases of the study created a more complete picture of the studied phenomena (Foss & Ellefsen 2002).

In **Phase I**, a patient study intended to elicit in-depth information on patients' subjective views and needs regarding seclusion and restraint practices in psychiatric care. Focused interviews with open-ended questions were used (Denzin & Lincoln 2000, Burns & Grove 2005).

In **Phase II**, the personnel's perspective was explored. From the personnel's perspective, a qualitative methodology with a focus group interview was selected as a method to elicit information that could only surface in the context of communication among nurses and among physicians (Patton 2007). The rationale for the focus group method is that group processes can help people to explore and articulate their views in ways that would be less easily accessible in a one-to-one interview (Patton 2007, Tong et al. 2007). Focus groups explore collective phenomenology (McLafferty 2004).

Finally, in **Phase III** a randomized controlled open label study design was used to evaluate the impacts of the eLearning course on nurses' professional competence, job satisfaction and general self-efficacy (Moher et al. 2001). The eLearning course was evaluated according to Kirkpatrick's Four Levels model (1959, 1998), which represents a sequence of ways to evaluate education programmes. The four levels are: 1) reaction, measure of customer satisfaction, 2) learning can be defined as the extent to which participants change attitudes, improve knowledge, and/or increase skill as a result of attending the education programme, 3) behaviour can be defined as the extent to which change in behaviour has occurred because the participant attended the training programme and 4) results can be defined as the final results that occurred because the participants attended the programme. (Kirkpatrick D.L. 1959, 1998, Kirkpatrick D.L. & Kirkpatrick J.D, 2001, 2006.) In this study the focus was on levels (2-3) which evaluated nurses' knowledge, attitudes (learning), job satisfaction and general self-efficacy (behaviour). This was addressed in the effectiveness study where the primary outcome measure was nurses' knowledge on coercion-related legislation, physical restraint and seclusion. Secondary outcome measures were nurses' attitudes towards physical restraint and seclusion, job satisfaction and general self-efficacy.

4.2. Setting and sampling

In **Phase I**, focused interviews were conducted to explore psychiatric inpatients' experiences of seclusion and restraint on six acute psychiatric wards in two psychiatric hospitals. The study sample was 30 psychiatric inpatients. Purposive sampling was used in order to reach respondents likely to be able to provide information about the phenomenon under study, thus the sample was intended to represent patients treated in closed acute wards having experienced seclusion and restraint (Denzin & Lincoln 2000, Burns & Grove 2005). Patients were recruited over a five-month period (May 12,

2007 – October 31, 2007) from six wards of two psychiatric hospitals. They were able to speak Finnish, 18 years or over and gave written informed consent. Exclusion criteria were as follows: unable to speak Finnish and incapable of giving informed consent to participation. More detailed demographic data on the sample in the focused interview study are presented in Table 1, Paper I. (Paper I).

In **Phase II**, focus group interviews were conducted to ascertain nursing and medical personnel's perceptions of seclusion and restraint on six acute psychiatric wards in psychiatric hospitals. The study sample included 22 nurses and 5 physicians. Purposive sampling involved the conscious selection of nurses and physicians whose working experience in psychiatry was at least one year, who were working on the study wards during the study period, and who had repeatedly encountered aggressive and disturbed patients and practiced seclusion and restraint – common characteristics that enabled the gathering of rich, relevant, and diverse data pertinent to the research question (Burns & Grove, 2005). The study was carried out on six wards in two psychiatric hospitals in Finland 22-26 March, 2007. The wards were included in the study if they were acute closed-hospital wards practicing seclusion and restraint. The inclusion criteria were as follows: registered nurses and physicians, adequate command of Finnish, and written informed consent to participate in the study. More detailed demographic data on the sample in the focus group interview study are presented in Table 1, Paper I. (Papers II, III).

In **Phase III** the study was conducted on twelve acute psychiatric wards in three psychiatric hospitals. The intervention "ePsychNurse.Net" is an eLearning course based on the results of phases I (patient perspective) and II (nursing and medical personnel's perspective) and the literature review (Appendix 1) and an analysis of the health care systems, nursing education, legal norms, ethical codes and patient restrictions of six countries (Finland, England, Ireland, Italy, Lithuania, Portugal) (Välimäki et al. 2008). The pedagogical approach of the course is based on reflective learning (Lowe et al. 2007), a fusion of sensing, perceiving, intuition and thinking (Simpson & Courney 2007). In Phase II nursing and medical personnel described educational methods and content regarding educational needs in seclusion and restraint practices (Paper III, Table 3). These suggestions and the literature review were used in the ePsychNurse.Net, which includes the following six main modules: 1) legal issues, 2) ethical issues, 3) behaviour-related internal and external factors, 4) therapeutic relationship and self-awareness, 5) teamwork, and 6) integrating knowledge with practice. Each module includes individual exercises and background reading, a peer discussion forum, a reflective journal, and an individual assignment. Additionally, modules three and six included a virtual patient case and module four included self-awareness exercises. Both patients' and personnel's suggestions were used in a virtual patient case, where a student could choose alternatives instead of seclusion and restraint using the decision making tree. These alternatives were proposed both by patients and personnel in Phases I and II. (Paper IV).

To estimate the number of nurses in both groups the power calculation was performed with the primary outcome measure nurses' knowledge of coercion-related legislation, physical restraint and seclusion (Koopmans 1987, Moher et al. 2001). The study

sample included 158 nurses. Such a design enables comparison and testing the differences between two groups before and after the intervention (Trochim, 2006). The study sample was formed with random sampling on the ward level. The wards were included if they were acute psychiatric inpatient wards practicing seclusion and restraint and if they were not involved in other seclusion and restraint research or development projects. Nurses working on the study wards were included if they were qualified nurses (registered nurses, mental health nurses, head nurses or deputy head nurses), having a permanent or long-term (over three months) position on one of the study wards, aged over 18 years with sufficient command of Finnish language, and were willing to participate. The nurses (at baseline n=228, at follow-up n=158) on twelve acute psychiatric wards were randomly allocated to the eLearning course ePsychNurse.Net (n=115, intervention group) or conventional continuing vocational education (n=113, control group). The participant flowchart in the randomized controlled study is presented in Figure 1, Paper IV.

Table 1. Phases, design, sample, setting, instruments, methods of data collection and analysis of the study

Phase	**Design**	**Sample, setting**	**Instrument**	**Data collection**	**Data analysis**
I	Explorative study (Paper I)	Inpatients (n=30) Acute wards in two psychiatric hospitals	Focused interview schedule	Focused interviews	Inductive content analysis
II	Explorative study (Paper II)	Nurses (n=22, 3 focus groups) and physicians (n=5, 1 focus group) Acute wards in two psychiatric hospitals	Semi-structured interview schedule	Focus group interviews	Inductive content analysis
II	Explorative study (Paper III)	Nurses (n=22, 3 focus groups) and physicians (n=5, 1 focus group) Acute wards in two psychiatric hospitals	Semi-structured interview schedule	Focus group interviews	Inductive content analysis
III	Randomised controlled study (Paper IV)	Nurses (n=158) Acute wards in three psychiatric hospitals	Structured question-naires	Self administered survey	Descriptive statistics, Chi-Square test, T-test, one-way ANOVA, Post-hoc Tukey's & Tamhane, repeated measures ANOVA, Partial Eta-squared test

4.3. Instruments

In **Phase I**, a focused interview schedule formed the topic guide for conducting patient interviews. The focused interview questions were open-ended, allowing participants to describe their experiences, views and suggestions on seclusion or restraint in their own words (Tong et al. 2007). The patient interview questions are described in Table 2. (Paper I).

In **Phase II**, a semi-structured interview schedule formed the topic guide for the focus group interviews with the nursing and medical personnel. Focus groups are suitable where the prime objective is to obtain accurate data on a limited range of specific issues (Robinson, 1999). Focus group interviews encourage the natural spontaneity of peer discussion. The focus group questions were open-ended, allowing the respondents to express their views on seclusion and restraint in their own words. The focus group questions are described in Table 2. (Papers II, III).

Table 2. Instruments and main questions in Phases I and II

Instruments and main questions in Phases I and II
Phase I: Focused interview schedule 1) Can you describe your latest seclusion or restraint experience, what was it like? (Paper I) 2) What kind of suggestions do you have on how to reduce the use and improve practices of seclusion or restraint? (Paper I) 3) What kind of alternatives would you prefer instead of seclusion or restraint? (Paper I)
Phase II: Semi-structured interview schedule 1) What actually happens when a patient becomes aggressive on your ward? (Paper II) 2) What alternative methods do you have instead of seclusion or restraint on your ward? (Paper II) 3) What kind of mode of action for aggressive and disturbed patients is there on your ward? (Paper III) 4) What kind of education and support would you like to have in relation to the management of aggressive and disturbed patients? (Paper III)

In **Phase III**, structured questionnaires were used with nurses. The details of the measurement instruments used in Phase III are given in Tables 1 and 3, Paper IV.

The primary outcome measure, *Knowledge of coercion-related legislation, Knowledge on physical restraint and Knowledge on seclusion* was assessed with three instruments (Immonen 2005, Janelli et al. 1992, Janelli et al./modified version 2007). The reliability of the instruments has been tested through Cronbach's alpha value. Internal consistency (i.e. the degree to which all items of the instrument measure the same attribute or dimension) was found satisfactory except Physical Restraint Questionnaire Knowledge and Attitude Scales (Kottner & Streiner 2010).

The Knowledge of Coercion-Related Legislation Questionnaire (Immonen, 2005) was used to assess nurses' knowledge of coercion-related legislation. This is a self-report questionnaire developed to assess respondents' knowledge of the Act on the Status and

Rights of Patients and factors effecting respondents knowledge. The instrument has been used in Finland. In this study two of the scales were used: awareness of legislation and importance of legislation. In this study four Likert-type items (1 = very well; 5 = very bad) were used and the Cronbach's alpha value for the four items was 0.758. (Paper IV).

The Physical Restraint Questionnaire Knowledge Scale (Janelli et al. 1992) was used to assess nurses' knowledge of physical restraint. The instrument was developed and largely used to assess nursing personnel's knowledge of physical restraint in general hospitals, nursing homes, psychogeriatric, neuropsychiatric and rehabilitation units in America (Janelli et al. 1992, Janelli et al. 1994, Terpstra et al. 1998, Morrison et al. 2000, Janelli et al. 2006) and in Asia (Suen 1999, Yeh et al. 2004, Suen et al. 2006, Huang et al. 2009). With the permission of the developer of the instrument, the Physical Restraint Questionnaire Knowledge Scale (Janelli et al. 1992) was also modified to seclusion (Janelli et al./modified version *the Seclusion Questionnaire Knowledge* Scale 2007). Seven somatic items (regarding the use of bands and belts in restraint) were omitted because they did not suit seclusion. The Knowledge Scale consisted of 27 items (18 for physical restraint and 11 for seclusion) with right and wrong responses (1 = right; 0 = wrong or undecided). Cronbach's alpha value of the Physical Restraint Questionnaire Knowledge Scale was 0.61 in a report by Huang et al. (2009). (Paper IV).

The secondary outcome measures consisted of attitude to physical restraint and seclusion, job satisfaction and general self efficacy.

The Physical Restraint Questionnaire Attitude Scale (Janelli et al. 1992) was used to assess nurses' attitudes to physical restraint. The instrument was developed and largely used to assess nursing personnel's knowledge about physical restraint in general hospitals, nursing homes, psychogeriatric, neuropsychiatric and rehabilitation units in America (Janelli et al. 1992, Janelli et al. 1994, Terpstra et al. 1998, Morrison et al. 2000, Janelli et al. 2006) and in Asia (Suen 1999, Yeh et al. 2004, Suen et al. 2006, Huang et al. 2009). With the permission of the developer of the instrument, the Physical Restraint Questionnaire Attitude Scale (Janelli et al. 1992) was also modified for seclusion (Janelli et al./modified version *the Seclusion Questionnaire Attitude Scale 2007)*. The Attitude Scale consisted of 24 items (12 for physical restraint and 12 for seclusion) with five-point Likert-type responses (1 = totally agree; 5 = totally disagree). The Cronbach's alpha value for the Physical Restraint Questionnaire Attitude Scale was in this study 0.671 (in Huang et al. 2009 study 0.66) and Seclusion Questionnaire Attitude Scale was 0.63. (Paper IV).

The Job Satisfaction Scale (Vartiainen 1986) was used to assess nurses' job satisfaction. The Job Satisfaction Scale is a part of larger Job Diagnostic Survey (JDS) developed by Hackman & Oldman 1974 in America. JDS was assessed to diagnose existing jobs to determine if and how they might be redesigned to improve employee motivation and productivity and to evaluate the effects of job changes on employees. Earlier studies indicated that the instrument JDS is feasible, has been widely used and its reliability and validity have been perceived to be good (Hackman & Oldman 1974,

1975, Harvey et al. 1985, Kulik et al. 1988). Vartiainen modified the Finnish shorter version in 1986. The Job Satisfaction Finnish Scale consisted of 14 seven-point Likert-type items (1 = very dissatisfied; 7 = very satisfied). In this study the Cronbach's alpha value was 0.85. (Paper IV).

The General Self-Efficacy Scale (Jerusalem & Schwarzer, 1992) was used to assess nurses' general self-efficacy (i.e. experience of own capability as a nurse). This is one of the most widely used scales to measure general self-efficacy (Barlow et al. 2000, 2006, Scherbaum et al. 2006, Leigh 2008). It was developed in Germany and has been translated into 28 languages. It has been used in several studies and its reliability and validity have been perceived to be good (Barlow et al. 2000, 2006, Scherbaum et al. 2006, Leigh 2008). The General Self-Efficacy Scale consisted of 10 four-point Likert-type items (1 = not at all true; 4 = exactly true) regarding self-knowledge and general self-efficacy. The claims are calculated on a scale 10-40 (Jerusalem & Schwarzer, 1992, Barlow et al. 2000, 2006). In this study the Cronbach's alpha value was 0.87. (Paper IV).

To ensure the adequacy of the Finnish versions of the instruments, the original questionnaires (Janelli et al. 1992, Jerusalem & Schwarzer 1992) were translated from and back-translated into English (for the method, see Jones et al. 2001). The original Physical Restraint Questionnaire Knowledge and Attitude Scales (Janelli et al. 1992) were modified for seclusion. A specialist panel of five nurses evaluated the clarity and cultural relevance of the Finnish version. Thereafter the feasibility of the questionnaire was evaluated in a pilot study with 30 nurses not involved in the main study. The medical aspects of the questionnaires were checked by three psychiatrists (Burns & Grove 2005). (Paper IV).

4.4. Data collection

In **Phase I**, the patient interview data were collected by four nursing researchers including the doctoral student who were the main researcher. All four researchers had a professional background in psychiatric nursing and training in conducting patient interviews. To capture acute and recent experiences, the patients were interviewed on the study wards 2-7 days after seclusion or restraint. Clinical assessment of the patient's ability to be interviewed without risk of harm was performed by a physician and nurse prior to enrolment. Altogether 31 patients were interviewed. The duration of the interviews conducted ranged 11-60 (M=25) minutes. Interviews were tape-recorded with patients' permission and transcribed. For five patients who did not give their permission for tape-recording, careful notes were made. The demographic characteristics of the patients were collected from the patient documents and the data on seclusion/restraint incidents were derived from the hospitals' seclusion and restraint database. (Paper I).

In **Phase II**, nurses' and physicians' focus group interview data were collected by four researchers trained in conducting focus group interviews. The interviewers informed participants about the study and participants' own rights. After that participants gave their written informed consent. Of the 22 nurses and 8 physicians invited, all 22 nurses

and 6 physicians were screened and included. The professions were divided into separate groups (nurses and physicians), which facilitated airing of opinions, information and feelings within professional groups. There were 5-8 participants and two researchers in each focus group. Each focus group interview lasted 80-100 (M=90) minutes. The focus group interviews were all tape-recorded and transcribed. (Papers II, III).

In **Phase III**, the participants completed the questionnaire including knowledge on coercion-related legislation, physical restraint, seclusion, attitudes towards physical restraint, seclusion and job satisfaction and general self-efficacy. The intervention group took the eLearning course ePsychNurse.Net related to seclusion and restraint practices after baseline measurement and before follow-up. The data were collected at baseline, January 2009, (two weeks before the intervention) and immediately after completion of the course May 2009 (3 months). The response time allowed was two weeks. The completed questionnaires were placed in sealed envelopes and further into a locked box until collected by the researchers. Of 228 participating nurses 158 (69 %) completed the three-month follow-up. The follow-up rate was 85 % for the intervention group and 66% for the control group. (Paper IV).

4.5. Data-analyses

In **Phases I and II**, the qualitative data were analysed by inductive qualitative content analysis, which is a process used for the systematic and objective analysis of documents (Graneheim & Lundman 2004, Burns & Grove 2005, Tong et al. 2007). The interviews were transcribed verbatim and the transcriptions of the interviews were read through several times to form a general picture of the material as a whole. The unit of analysis was an utterance, which could be a sentence or part of a sentence consisting of thematic content relevant to the research question. Reduction of the data was done by picking out and underlining phrases answering the research question. Data was coded by labelling reduced phrases with a description according to thematic content that could be seen to characterize the phrases. Subcategories were then formed for these coded phrases by grouping together those with similar content. Any outstanding discrepancies concerning subcategories were resolved. Finally, the set of main categories was established by grouping together subcategories with similar meaning. This form of analysis provided coherence and structure for the data, ensuring that the original data was not skewed in any way. To overcome the possible effects of the researchers' subjective perceptions two researchers analysed the same data set independently and thereafter compared and verified the content and categories obtained (Burns & Grove 2005, Tong et al. 2007). There was only one difference in the analyses of patient interview data regarding the number of categories in patients' suggestions regarding the improvement of seclusion and restraint practices. The main researcher had five categories and the other researcher had seven categories. The discrepancy was solved with the supervisor of the research and the result was five categories. (Papers I, II, III).

In Phase II, the focus group data from nurses and physicians were first handled separately. Since they were mainly similar, the final analysis comprised the whole group (i.e. nurses and physicians together). (Robinson 1999, Graneheim & Lundman 2004, Tong et al. 2007, Polit & Beck 2010.) (Papers II, III).

In **Phase III**, when background characteristics at baseline between groups were compared, chi-square test was used for categorised variables and one-way analysis of variance (ANOVA) for continuous variables. To identify differences in change of nurses' knowledge, attitudes, job satisfaction and general self-efficacy between the two groups at 3 months mean score changes were compared using Paired T-tests. Changes in mean scores were calculated with group and measurement interaction effect in Repeated Measurements ANOVA. To measure effect size Partial Eta-squared was used. To investigate the change in nurses' knowledge, attitudes, job satisfaction and general self-efficacy in groups during the 3-month follow-up mean differences of the mean score changes were analyzed using Paired T-tests. In all analyses, a significance level <0.05 was considered to be statistically significant. Statistical analyses were performed using SPSS version 16.0 (Koopmans 1987.) (Paper IV).

4.6. Ethical considerations

This study adhered to the basic principles of research ethics at every stage of the study (Nuremberg Code 1949, Medical Research Act 488/1999, Academy of Finland 2004, ETENE 2001, 2007). Ethical considerations in a study start with the selection of research topic and continue to the publication of research findings (Burns & Grove 2005). The participants' human rights, autonomy and anonymity were respected throughout the research process, and the respondents were treated in a way that they could decide for themselves whether or not to participate in the study. Study procedures for each phase were approved by the Ethics Committee of the Hospital District of Helsinki and Uusimaa (HUS 13.3.2007, §50). Permission for data collection was obtained from the authorities of the participating organisations. All data collected during this research process was handled and stored in an appropriate way (Archive Act 831/1994, Personal Data Act 523/1999, Constitutional Act 731/1999, Kuula 2006). Data was protected from deliberate, unintentional or unauthorized alteration, destruction and inappropriate disclosure or use in accordance with established policies and practices (Archive Act 831/1994, Kuula 2006, Polit & Beck 2010).

In **Phase I**, in patients' interviews, the study protocol was approved by the Ethics Committee and permission for data collection was obtained from the directors of the hospitals. People with mental disorders are a vulnerable group in health care (WHO 2005), and mental illness may affect people's competence in decision-making (Koivisto et al. 2001), therefore, it is especially important to consider ethical aspects of the study in more detail. E.g. how voluntary consent, withdrawal of subjects from studies, protection of subjects from physical and mental suffering, injury, disability, and death, and the balance of benefits and risks in a study are taken into account (Nuremberg Code 1949). Clinical assessment of the patient's ability to be interviewed without risk or harm was performed by a physician and a nurse. The patients'

awareness of the purpose of the study was ensured in two ways: through oral explanations and written instructions, which they get for the first time from their nurse and physician on the ward after seclusion or restraint. Before interviewing, the researcher clarified in detail the aim of the study and respondent's rights (Polit & Beck 2010). The respondents signed a consent form acknowledging that they were participating in the study on a voluntary basis. Interviews were tape-recorded with the patient's permission and transcribed. For five patients who did not give permission for tape-recording, careful notes were made. (Paper I).

In **Phase II**, in the focus group interviews basic principles of research ethics were followed at every stage of the study. The study was approved by the Ethics Committee of the Hospital District of Helsinki and Uusimaa (HUS 13.3.2007, §50). Permission for data collection was obtained from both the study hospitals' directors. The nurses' and physicians' participation was voluntary. Participants received oral and written information about the purpose of the study and their own rights as research participants. Written informed consent was obtained from all participants. To ensure that participants felt free to express their views, the researchers who conducted the interviews were not employed on the study wards. Using two researchers in a focus group enables better control of group cohesion and a more thorough observation of group dynamics and collection of data. The data were treated in confidence and participants' anonymity was ensured by encrypting the data during the analysis (Archive Act 831/1994, Personal Data Act 523/1999, Constitutional Act 731/1999, Kuula 2006). (Papers II, III).

In Phase III, the study followed the basic principles of research ethics (Academy of Finland 2004). The study protocol was approved by the hospital district's Ethics Committee of the Hospital District of Helsinki and Uusimaa (HUS 13.3.2007, §50) and the permission for data collection was obtained from the organizations' authorities. Questionnaires and their modifications were used with the permission of their developers. Participants received oral and written information about the purpose of the study and their rights. Informed consent to participate to the study was requested. It was emphasized that participation in the study was voluntary and that refusal would not affect the participant's working conditions. The data was treated in confidence and participants' anonymity was ensured by encrypting the data during the analysis (Archive Act 831/1994, Personal Data Act 523/1999, Constitutional Act 731/1999, Kuula 2006). (Paper IV).

5 RESULTS

The results are reported in three parts according to the aims of the study. The first part describes psychiatric inpatients' experiences and suggestions regarding seclusion and restraint practices in psychiatric hospitals (Paper I). The second part describes nursing and medical personnel's perceptions of seclusion and restraint practices in psychiatric hospitals (Papers II, III). The third part presents the results of a randomised controlled study testing the impact of a continuing vocational eLearning course on nurses' professional competence in seclusion and restraint practices (Paper IV).

5.1. Psychiatric inpatients' experiences and suggestions for seclusion and restraint practices

5.1.1. Psychiatric inpatients' experiences of seclusion and restraint

Patients experienced their seclusion or restraint as a longitudinal process starting before the seclusion or restraint, continuing through the seclusion or restraint as such, and ending after the seclusion or restraint. The study showed that the patient's perspective received insufficient attention during the seclusion and restraint process. Patients were dissatisfied with the way of being treated before seclusion and restraint, i.e. how the personnel took care of patients, or how they spoke to patients. Patients also reported a lack of information before seclusion or restraint. Patients did not get enough information about their situation, treatment and plans, what would happen next and about the reason for seclusion or restraint. During seclusion and restraint they had problems in the care of basic needs, e.g. washing, toileting, eating or drinking. The treatment facilities did not allow patients to maintain their basic needs. Patients had mainly negative but also positive experiences of patient-personnel communication. Patients wanted the real presence of a human being, more communication and human touch. Patients reported lack of activities while secluded or restrained, such as reading a book or magazine, listening to music or having some physical exercise. Patients' described different feelings inside the seclusion or restraint room. Patients felt anger, fear or loneliness. However, there were also patients who reported feelings of safety or calming effect during seclusion or restraint. After seclusion and restraint patients described the outcomes of seclusion or restraint as mainly negative (e.g. "deprivation of liberty, punishment, shock treatment") but there were also positive experiences (e.g. "part of care"). (Paper I).

5.1.2. Psychiatric inpatients' suggestions for improvements in seclusion and restraint practices

The improvement of seclusion and restraint practices concerns patients' expectations regarding the elements and interventions which they would like to receive if they need seclusion or restraint as a part of their treatment. Improvement of seclusion and

restraint practices was: humane treatment, external evaluators, up-to-date information, written agreements and patient-friendly environment. Improvements in seclusion and restraint practices as suggested by the patients focused on essential parts of nursing practice but have not been largely adopted. According to these study results patients' basic needs have to be met and patient-personnel interaction has also to continue during seclusion and restraint. Providing patients with meaningful activities, planning beforehand, documenting the patient's wishes, and making patient-personnel agreements reduce the need for restrictions. Service users must be involved in all practical development. A summary of the psychiatric inpatients' suggestions on improvements in seclusion and restraint practices is presented in Table 3. (Paper I).

Table 3. Psychiatric inpatients' suggestions for improvements in seclusion and restraint practices

Main category	**Description**
Improvement of seclusion and restraint practices	Patients' expectations regarding the elements and interventions which they would like to receive if they need seclusion or restraint as a part of their treatment
Humane treatment	Interaction with nurses and physicians; respectful attention meant being valued as an equal human being instead of as an aggressive and harmful patient in the seclusion or restraint room
External evaluators	E.g. ombudsman, the hospital chaplain with whom they wanted to talk about their seclusion or restraint experience
Up-to-date information	Information about patients' condition, treatment plans and when and why they need seclusion or restraint
Written agreements	Patients wished to see the written treatment plan themselves and to make written agreements on which steps they should follow
Patient-friendly environment	Patients' tangible proposals related to the seclusion and restraint rooms, e.g. how to increase humanity, comfort, safety, orientation and individual elements

5.1.3. Psychiatric inpatients' suggestions on alternatives to seclusion and restraint

The alternatives to seclusion and restraint comprised interventions proposed by patients. Alternatives to seclusion and restraint were: empathetic patient-personnel interaction, meaningful activities, therapeutic community and biological treatments. A summary of the psychiatric inpatients' suggestions on alternatives to seclusion and restraint is presented in Table 4. Patients' suggestions for alternatives to seclusion and restraint were essential elements when developing the content of continuing vocational eLearning course (ePsychNurse.Net) for psychiatric nursing. (Paper I).

Table 4. Psychiatric inpatients' suggestions for alternatives to seclusion and restraint

Alternatives to seclusion and restraint	Description
Empathetic patient-personnel interaction	More of nurses' and physicians' time spent with the patients on the ward, even silent presence beside, personnel's empathetic listening, attention and understanding, active communication
Meaningful activities	Patients underlined the importance of meaningful activities on the ward (daily activities, making coffee) or outside (physical activities, occupational therapies) to bring content to the idle days
Therapeutic community	Safe atmosphere and cosy environment of the closed wards; the role of nurses in creating this atmosphere together with the patients was pivotal; own peaceful single room
Biological treatments	First of all, medication, but also brain activity modulation (electric shock, magnetic stimulation) treatments

5.2. Nursing and medical personnel's perceptions of seclusion and restraint practices

5.2.1. Nursing and medical personnel's perceptions of the management activities related to patients' aggressive behaviour

The nursing and medical personnel described the management of patients' aggressive behaviour as a decision-making process occurring before, during and after seclusion/restraint (Table 5). (Paper II).

Table 5. Nursing and medical personnel's perceptions of the management activities related to patients' aggressive behaviour

Process of seclusion/ restraint (S/R)	Nursing and medical personnel's perceptions of the management activities related to patients' aggressive behaviour
Before S/R	Patient's versus others' best interest as an ethical dilemma: • Nurses had to balance the patient's best interests and those of other people when making decisions to seclude or restrain (or not) • Physicians had to regularize the decision of S/R either ad- or post-hoc, sometimes without seeing the patient
During S/R	Patient's versus others' best interests as the time and division of labour dilemma: • Nurses spent a lot of time with secluded and restrained patients; they had not enough time to spend with other patients • Patients' aggressive behaviour requires good co-operation between nursing and medical personnel, e.g. a clear division of labour and good communication among team members
After S/R	Psychological consequences and needs of patients and personnel: • When seclusion or restraint was over, nurses felt relief, tired and hopeless • A few days later it was important to discuss the situation and feelings of guilt; managers had an important clinical supervisory role to play in this regard • Debriefing was useful but they did it seldom

5.2.2. Nursing and medical personnel's perceptions of alternatives to seclusion and restraint

Both the nurses and physicians had considered alternatives to seclusion and restraint. Nursing interventions (being present, conversation, giving responsibility, providing meaningful activities and changing the environment) were used in everyday clinical practice. They were mentioned as the first step alternatives to seclusion and restraint. Multi-professional agreements involving aggressive patients were mentioned as an essential component of multi-professional meetings. In such agreements patients were seen as active participants, whose opinions and thoughts on their own treatment are valuable (step two). A patient's treatment plan would include agreements about medication and care in the patient's own room, leaving the seclusion room door open, constant observation and physical holding.

Nurses and physicians reported that instead of seclusion or restraint they could calm down aggressive patients by using authority and power (step three). Authority and power were associated with a physician's position, male nurses and number of nurses on the ward. This alternative was used especially for severely aggressive and uncooperative patients.

The study showed that mental health care personnel need to be encouraged and taught to tune in to a deeper extent to the reasons for patients' aggressive behaviour and to use alternatives to seclusion and restraint in order to better humanise patient care (Paper II).

5.2.3. Nursing and medical personnel's perceptions of the mode of action for the aggressive and disturbed patients

The mode of action was either a written mode of action or tacit knowledge. The physicians and most of the nurses emphasised the importance of written guidelines on the mode of action incorporating the relevant legislation, rules and criteria for practising seclusion and restraint. However, some nurses reported that they neither had nor needed written guidelines on the mode of action and that each seclusion or restraint situation is unique and therefore cannot be guided stereotypically with any standard rules or procedures. Regardless of the opinion on the need for a written manual or its availability in each ward or hospital, the description of the content was same. Mode of action included: using observational skills, therapeutic interaction, offering medication, considering alternatives and planning additional manpower. (Paper III, Table 2).

5.2.4. Nursing and medical personnel's educational needs in seclusion and restraint practices

Regarding the educational needs, participants discussed professional and organisational levels, educational methods and content. Participants proposed the use of practical education for nurses and physicians, directors, multidisciplinary teams and hospitals as a whole. They called for continuing education on ethical, clinical and legal issues and practical on-ward education as helpful in actual clinical situations. (Paper III).

Nurses and physicians described infrastructural and managerial support. Infrastructural support comprised personnel resources, facilities and instructions. Participants identified a need for increased personnel numbers on acute wards, a need for safer and smaller wards and a clear procedure for aggressive situations. Managerial support included the role of occupational health care, peer support and support and supervision from directors. Support from peers and directors was perceived as very important by both nurses and physicians. They would have liked to discuss ethically demanding decisions both in multidisciplinary team and with directors. (Paper III).

The nursing and medical personnel's subjective needs for seclusion- and restraint-related education in the context of the actual mode of action and needs for support for nursing practice have not been earlier reported. The parallel exploration of these facets of seclusion- and restraint-related know-how made it possible to uncover some previously unknown phenomena. The results showed that future educational programmes should bring together written clinical guidelines, education on ethical and legal issues and the personnel's support aspect. (Paper III, Table 3).

5.3. Impact of continuing vocational eLearning course on nurses' professional competence in seclusion and restraint practices

The primary outcome measure was nurses' knowledge of coercion-related legislation, physical restraint and seclusion. Secondary outcomes included attitudes towards physical restraint and seclusion, job satisfaction and general self-efficacy. The control group had continuing vocational education as usual, essentially fragmentary and irregular. The intervention group took a continuing vocational eLearning course, which included six modules and lasted 120 hours over three months. (Paper IV, Intervention).

A total of 228 nurses were randomly assigned to two groups: ePsychNurse.Net, an eLearning group (intervention, n=115) and an education-as-usual group (control, n=113). Of these nurses 158 (69 %) completed the three-month follow-up (Paper IV, Figure 1). The follow-up rate was 85 % (n=98) for the ePsychNurse.Net intervention group and 66% (n=75) for the education-as-usual control group. Baseline characteristics of randomized nurses were much the same in each group (Paper IV, Table 2). These differences in the response rates between intervention and control groups were statistically significant (p=0.001). Altogether 101 nurses completed the continuing vocational eLearning course (ePsychNurse.Net). (Paper IV).

At baseline, there were no statistically significant differences between group differences in any characteristics (Paper IV, Table 2) or in total scores (p=0.074-0.720). Between group comparisons of change after the intervention revealed no differences in primary outcome (Knowledge about physical restraint, seclusion and coercion-related legislation). No statistically significant differences emerged in the secondary outcome measures either, except attitude to seclusion in favour of the control group. No noticeable effect size was observed on any variable. (Paper IV, Table 3.)

In within group analysis, knowledge about physical restraint improved in both intervention and control groups (p=0.001 in each group). Further, knowledge about

coercion-related legislation and general self-efficacy improved in the intervention group (p=0.036 and 0.046 respectively), while attitude to seclusion improved in the control group (p=0.001). No other statistically significant changes were found.

The study results did not support the hypotheses of the study. There were no differences in the primary outcome measure, nurses' knowledge of the coercion-related legislation, physical restraint and seclusion between different education groups (intervention group: eLearning course and control group: education-as-usual). No statistically significant differences emerged in the secondary outcome measures either regarding attitudes towards physical restraint, job-satisfaction and general self-efficacy between the eLearning course and education-as-usual. There was only one exception, namely attitude to seclusion in favour of the control group.

5.4. Summary of the results

To summarise, the study results of different study phases are described according to the aims of the study.

Patients' perspectives received insufficient attention during seclusion and restraint process. Improvements and alternatives to seclusion and restraint as suggested by the patients focused on essential parts of clinical nursing but have not been widely adopted. Patients' basic needs have to be met and patient-personnel interaction has to continue during seclusion and restraint. Providing patients with meaningful activities, planning beforehand, documenting the patient's wishes, and making patient-personnel agreements reduce the need for restrictions and offer alternatives for seclusion and restraint. Service users must be involved in all practical development. (Paper I).

Nursing and medical personnel believed that the decision-making process for managing patients' aggressive behaviour includes some inherent ethical dilemmas. They thought that patients' subjective perspective received little attention. Nevertheless, the personnel proposed and appeared to use a number of alternatives to minimize or replace the use of seclusion and restraint. Nursing and medical personnel need to be encouraged and taught to tune in to a deeper extent to the reasons for patients' aggressive behaviour and to use alternatives to seclusion and restraint in order to make patient care more humane. The results showed that future educational programmes should bring together written clinical guidelines, education on ethical and legal issues and the personnel's support aspect. There is a need to develop seclusion- and restraint-related continuing vocational education based on this multi-faceted approach. (Papers II, III).

Regarding the outcomes of innovative learning methods to support professional competence the impacts of the eLearning course ePsychNurse.Net and conventional education on nurses' knowledge, attitudes, job satisfaction and general efficacy were evaluated. There were no statistical differences between eLearning group and as-usual-education group. The study showed that the ePsychNurse.Net, an affordable and easy-to-access learning instrument, may, with certain reservations, be recommended for the continuing vocational education of nursing personnel in psychiatric institutions. ePsychNurse.Net is worth further development with more flexible time schedules and individualisation of content. (Paper IV).

6 DISCUSSION

The purpose of this study was to support evidence based clinical nursing regarding seclusion and restraint practices. This was done by ensuring professional competence through innovative learning methods. Studies on psychiatric inpatients' and nursing and medical personnel's perspectives and the impact of an eLearning course on nurses' professional competence yielded information about the realisation of clinical nursing in seclusion and restraint practices in Finnish psychiatric hospitals today. This knowledge can be used to ensure professional competence with innovative learning methods to improve clinical nursing in psychiatric hospitals. The study has implications for different fields including clinical nursing, management, education and nursing science.

In this chapter, the validity and reliability of the study are first discussed. Second, the main findings are discussed in relation to the literature in accordance with the aims of the study. Third, conclusions and implications for the development of professional competence with innovative learning methods to improve clinical nursing in seclusion and restraint practices are considered. Finally, suggestions for future research are presented.

6.1. Validity and reliability of the study

The adequacy of the research process was examined by assessing the validity and reliability of the study. Validity is a measure of the truthfulness and accuracy of a study in relation to the phenomenon of interest. Reliability represents the consistency of the measurements (Kottnet & Streiner 2010). Although validity can never be fully proved, it is always possible to support the extent to which the research measures what is intended to measure (Burns & Grove 2005). The validity and reliability of the study are next discussed in relation to different study phases considering relevant aspects in each phase. The validity and reliability of the instruments used in this study have been described more fully elsewhere (Chapter 4.3. Instruments).

Phase I

Credibility is considered to be a form of internal validity meaning that the results are credible from the perspective of the participant (Hattcher et al. 2005, Gravetter et al. 2008, Polit & Beck 2010). It is important that participants have personal experience of the phenomena under investigation. The study sample was formed from patients who had experience of seclusion and/or restraint in psychiatric hospital. In this study, patients who were willing to participate, and likely to be able to provide information about the topic (information-rich cases), formed the study sample (Malterud 2001, Kylmä et al. 2003). However, probability sampling may cause bias, because it is not possible to know if these patients actually were typical or atypical patients (Burns & Grove 2005). In the data collection phase, respondents had an opportunity to clarify unclear issues during the interviews. Interviews were tape-recorded with patients' permission and transcribed. For five patients who did not give their permission for tape-recording, careful notes were made and participants checked the written answers

and gave their feedback if notes were not in line with their responses. Interviews were conducted until data saturation was achieved (Burns & Grove 2005).

Transferability is considered as a form of external validity referring to the generalizability of the results to other settings (Miles & Huberman 2001, Silverman 2001, Polit & Beck 2010). One of the main transferability issues concerns the recruitment of participants (Morse 1991). For this study, the participants were selected on the basis of a set of inclusion criteria. Selection bias was avoided by allowing the participants to make their own decisions on whether or not to participate. The study was conducted on six wards in two psychiatric hospitals. This could affect the transferability of the results because health care institutions vary widely in their organization, experience, and resources (Rummel-Kluge et al. 2006, Albada et al. 2007). A number (n=27, 23%) of patients were not offered participation at all due oversight by the personnel. Eventually, only 31 patients (26% of 120 potential participants) were interviewed, which could bias our results. Indeed, it is possible that some of the patients were deliberately excluded by the personnel. This could not be rigorously explored. However, this is unlikely, since in uncertain cases a second opinion was obtained from researchers and senior physicians. Thus, it is unlikely that only patients with positive experiences or with only negative experiences were involved in the interviews. In this study, due to the small sample size the results cannot be generalised to represent the whole study population, although according to the hospital records there was a similar distribution of patients' age and gender in the study population and all patients discharged from the study wards during the data collection period. However, the purpose of this study was not to provide objective unbiased generalisable data, but rather to obtain qualitative in-depth information on patients' subjective views and needs (Malterud 2001, Burns & Grove 2005). The findings were consistent with those of earlier studies and therefore likely to have wider relevance. Nevertheless, the results cannot be extrapolated to patients with major cognitive decline or those with a different (i.e. foreign) cultural background.

Dependability refers to reliability in terms of the stability of data over time and conditions (Silverman 2001, Polit & Beck 2010). This was supported in the present study by describing the research process, the environment in which the study was carried out and other solutions in detail so that other researchers could follow the research process. The interview schedule was piloted with two patients in acute psychiatric ward. Four interviews were trained to carry out interviews to ensure their uniformity. There were no differences between the four researchers' interviews regarding the length of the interview or the amount of the data. All four researchers had long working experience (12-20 years) in psychiatry and it could add to the understanding of the patient and the content of the interview and in turn to the reliability of the study. The availability of comprehensive information incorporating all important aspects of the interview was ensured by carefully reading the transcripts and returning repeatedly to origin data. The use of two categorisers in the data analysis process might have increased the dependability of the study (Graneheim & Lundman 2004).

Conformability refers to the objectivity of the data. It is essential that the results be based on the data, not merely the researchers' conceptions. (Tong et al. 2007, Polit &

Beck 2010.) This was supported by describing the different stages of data analysis in detail. In addition, direct quotes were provided in the research report to support the analysis. Four independent interviewers collected the data. To overcome the possible effects of the researchers' subjective perceptions two researchers analysed the same data set independently and thereafter compared and verified the resulting content and categories (Lundman & Graneheim 2004, Tong et al. 2007). The long psychiatric working experience of all four researchers could add to the understanding of the data and in turn to the conformability of the study. Furthermore, the analysis was discussed in doctoral students' seminars in order to increase the conformability of the results.

Phase II

The credibility of Phase II was enhanced during different phases of the study process. Purposive sampling involved the conscious selection of nurses and physicians who had repeatedly encountered aggressive and disturbed patients and practised seclusion and restraint – common characteristics that enabled the gathering of rich, relevant and diverse data pertinent to the study questions. Therefore the results can be considered to represent these nurses' and physicians' perspectives. (Malterud 2001, Kylmä et al. 2003, Burns & Grove 2005.) During data collection pre-planned questions were used as a topic guide. The aim was to ensure that the focus-groups interviews were uniform in nature but also to avoid leading questions. Respondents were given an open opportunity to describe their perceptions and the moderator encouraged group interaction. The professionals were split into separate focus groups (nurses and physicians), which facilitated the airing of opinions, information, and feelings within the professional group. Interviews were tape-recorded with participants' permission and transcribed. Credibility can also be enhanced by using member checking, where participants verify interpretations and conclusions. This was not done for practical reasons. (Robinson 1999, Silverman 2001, Polit & Beck 2010.)

Transferability of the findings may be influenced by the circumstances in which a study is conducted (Burns & Grove 2005). The study was conducted on six wards in two psychiatric hospitals in southern Finland, the results cannot be generalized either nationally or internationally, as they cannot be regarded as representative. The focus group interviews were carried out on the premises the informants preferred (at their workplace) and sufficient time was reserved for each focus group interview. The interviews lasted from 60 to 90 minutes. In this study, informants were motivated to participate and the dropout rate was low (out of 30 participants invited, 27 were present at the focus group interview sessions). Purposive sample, natural setting, and positive group dynamics and interaction seemed to enhance data collection and yield rich and diverse data pertinent to the research questions. The purpose of this focus-group study was to gain in-depth information rather than to produce generalized findings (Robinson 1999, Silverman 2001, Burns & Grove 2005). Despite these limitations, the findings of the study were in line with earlier studies and are therefore generalisable.

Dependability was supported in the present study by describing the research process, the environment in which the study was carried out and other solutions in detail so that other researchers could follow the research process (i.e. auditability) (Lincoln & Cuba 1985, Miles & Huberman 2001). A pilot study on nurses (n=13) was carried out on two

acute psychiatric wards to test the suitability of focus group interview for the study phenomena, the feasibility of the semistructured interview form, and the definition of the researchers' role. Four interviewers were trained to carry out focus group interviews (two interviewers in each focus group). The use of two researchers as categorisers in the data analysis process might have increased the dependability of the study. The researchers went back to the raw text several times during the data analysis to make sure the voice of the informants was properly represented. The correspondence of the original statements with the categories created is also openly presented.

Conformability of this study was supported in that the researcher was constantly and consciously careful not to let her personal views based on extensive experience in psychiatric and mental health services affect either the analysis or the findings. This was considered especially important because the researcher was involved in the development of the intervention under investigation. Two researchers analysed the same data set independently and thereafter compared and verified the content and categories obtained (Tong et al. 2007). The focus groups' informants did not know the researchers personally, which facilitated a professional distance from their experiences. Researchers not involved in the research then evaluated the process, results and conclusions of the study. Moreover, different phases of the study were described in detail and the relations data and categories were verified with quotations to ensure that the results and conclusions of the study were indeed based on the data. (Silverman 2001, Polit & Beck 2010.)

Phase III

Internal validity refers to the degree to which an instrument measures what it is supposed to measure (Polit & Hungler 1999, Burns & Grove 2005). In Phase III the study approach was randomised controlled study. In this study, all efficacy measures used, although valid and reliable as such, were developed for non-psychiatric settings. Due to a striking lack of structured instruments for researching physical restraint and seclusion in psychiatry, they were simply adapted by the authors (with the developers' permission) for this study. The unchanged knowledge about seclusion in either group could thus result from the measurement used. Indeed, the Physical Restraint Questionnaire was developed specifically for physical restraint, not seclusion and validated in neurological and geriatric, not psychiatric settings. The seven somatic items of the questionnaire were eliminated by the authors to adjust it for seclusion, which could rob the measure of its initial power and sensitivity to change. This would affect to the internal validity of the study. The validity of the randomised controlled study is evaluated through randomisation, blinding, data collection, data analysis and minimising the role of change. In this study, the participant nurses were allocated to intervention or control groups according to their baseline ward affiliation. The participant nurses were qualified nurses (registered nurses, mental health nurses, head nurses or deputy head nurses). Allocation was concealed until the start of the intervention, but personnel and researchers could not be blinded thereafter due to the nature of the intervention. It is possible that information have flowed from the intervention (ePsychNurse.Net) group to the control (education-as-usual) group. There were no differences between the groups at baseline. Data were collected in a similar manner in all groups in both measures (baseline and follow-up). The main data analysis

was conducted at individual level and only completer analysis was performed (Hollis & Campbell 1999). Regarding the internal validity of the analysis, statistical analyses to compare groups for primary outcome and secondary outcomes were carried out according to a pre-established analysis plan (Altman et al. 2001, Hatcher et al. 2005).

External validity refers to representative sample size and generalisability of the results (Burns & Grove 2005). The sample size of the study was estimated according to power calculations with the primary outcome measure (Knowledge to Legislation, Physical Restraint Questionnaire/Knowledge, Seclusion Questionnaire/Knowledge) analyzed with two-group univariate repeated measures ANOVA. To get 1.0 differences of mean score changes between two groups (SD=1.0 within measurements) statistically significant at the 0.05 level with 90 % probability (group and measurement interaction), sample size was at least 39 in each group. (Koopmans 1987). The power calculations were made before the data collection in order to minimize the role of change. Drop-out rates were higher in the control group. The response rates were quite satisfactory; at baseline 85 % and at follow-up 76 %. The differences in the response rates between intervention and control groups were statistically significant (p=0.001). The effect of drop-out and the validity of the complete cases were examined with full sample analyses. The drop-out did not seem to cause any extra bias to the analyses of complete cases. Cronbach's alpha values for the scales were as good both at baseline and follow-up (Paper IV, Table 2). To avoid settings and locations affecting external validity the study was carried out in three hospitals and on twelve wards.

6.2. Main findings

The overall goal of this study was to support evidence based clinical nursing in patient seclusion and restraint practices. This was done by ensuring professional competence through innovative learning methods. The study generated evidence based knowledge of seclusion and restraint practices in psychiatric hospitals from the perspective of patients, nursing and medical personnel. The study linked these perspectives together and explored the needs and suggestions how to improve practices and use alternatives. The results of patient, nursing and medical personnel's studies (Phases I and II) and the literature review were used in developing the content and methods of the eLearning course ePsychNurse.Net. Regarding the outcomes of innovative learning methods to support professional competence the impacts of the eLearning course ePsychNurse.Net and conventional education on nurses' knowledge, attitudes, job satisfaction and general efficacy were evaluated. The study showed that the eLearning course was not more effective than conventional education in the short time period (three months). An eLearning course alone is insufficient to change nurses' knowledge, attitudes, job satisfaction or general efficacy and it needs to be accompanied by more extensive organisational changes especially in acute inpatient facilities. The study was conducted at national level and the study results were used at international level in the European Commission Project ePsychNurse.Net. The study had international relevance integrating evidenced based and experienced based knowledge. The results of the study are next discussed in light of the aims and research questions.

6.2.1. Psychiatric inpatients' experiences and suggestions for seclusion and restraint practices

The patients in our study experienced seclusion and restraint as mainly negative and patients' own perspectives reportedly did not receive sufficient attention. Patients felt that the time spent in seclusion and restraint was long, boring and distressful, since they had nothing to do. These findings are consistent with earlier findings (Frueh et al. 2005, and Keski-Valkama et al. 2010). The finding of unmet basic physical needs during seclusion and restraint period was striking. In some seclusion and restraint cases patients in our data were even denied access to toilet facilities and had to defecate on the floor. Although easier access to the toilet has been proposed by patients in earlier studies (Keski-Valkama et al. 2010), such an extreme violation of basic rights as with our patients has not, to the best of our knowledge, been reported earlier. These findings indicate a need for profound changes in both the seclusion and restraint culture and administrative control for the current - sometimes unacceptable - practices. For example, the "design" of the seclusion room has been similar for decades, aiming not only to diminish stimuli but in fact deprive patients (Muraliharan & Fenton 2006). Since current seclusion and restraint practices fail to show clinical effectiveness as a treatment for aggressive behaviour (Wright 2003, Nelstrop et al. 2006) or serious mental disorders (Sailas & Fenton 2000), it is obviously time to improve the seclusion and restraint practices and employ novel interventions. As a part of this transformation, a more comfortable and safely furnished environment should be tested in Finnish psychiatric settings.

Patients' suggestions for improvements in psychiatric care should be taken seriously. The patients in our study expressed negative feelings due to a perceived lack of therapeutic interaction with the personnel in the process of seclusion and restraint. To respond to these needs, some clinical measures could be considered. For example, a nurse in charge could be appointed for every seclusion and restraint episode to take care of the communication with the patient. This communication should include at least essential arguments for the use of seclusion and restraint, its estimated duration and expected results. Due to the current lack of such sufficient interaction with the personnel, our patients proposed this interaction and, in addition, the use of external evaluators to discuss their seclusion and restraint experiences. This proposal of external evaluators concurs with some earlier studies (Kuosmanen et al. 2007). The Finnish national recommendations (Ministry of Social Affairs and Health 2009) also encourage the use of external evaluators, but once again, neither official recommendations nor scientific findings seem to be readily implemented in nursing practice.

The patients in our study focused on essential parts of nursing practice (empathetic interaction, meaningful activities, therapeutic community, and biological treatments) but they proposed only few new concrete alternatives to seclusion and restraint. This stresses the crucial role and responsibility of mental health professionals, in close collaboration with service users, in the inventing and implementation of new practical methods to diminish use of seclusion and restraint.

6.2.2. Nursing and medical personnel's perceptions of seclusion and restraint practices

Nursing and medical personnel overemphasized their own role in the care of aggressive patients, while patient's subjective perspective received negligible attention in our study. Participants spontaneously discussed the aggressive patient's own feelings and fears very little. It is an issue of serious concern, since tuning into the reasons for a patient's aggressive behaviour can facilitate better ways of dealing with aggression on the ward (Sullivan et al. 2004, Nachreiner et al. 2005, Bowers et al 2006, Kynoch et al. 2010). This issue can be approached in psychological terms of reflection and counter transference (Mitchell 2011); in terms of nursing ethics, i.e. understanding the patient's cultural background and relevant values to imaginarily identify with (Niven & Scott 2003, Nijman et al. 2005, Scott 2007, Hamilton & Manias 2008, Moran et al. 2009, Barker 2011), or in pragmatic terms of his/her personal history of behaviour, including history of violence (Barker 2011), as well as use of valid structured instruments of violence diagnostics (Fluttert et al. 2008, 2010). The future challenge is thus to improve methods for patient-personnel communication, i.e. to sensitise the personnel to mindful reflection on the patient's feelings and thereby to enhance their understanding of the causes and prevent aggression (Badger & Mullan 2004, Beech & Leather 2006, Foster et al. 2007, Huckshorn 2007, Björkdahl et al. 2010).

Both nursing and medical personnel reported ethical conflicts related to seclusion and restraint decision-making. While the nurses had to balance between the best interests of the patient and other people, the physicians experienced ethical conflict when making a post-hoc decision on a seclusion or restraint that had already taken place. In reality nurses were the key informants to describe the clinical condition of the patient and the details of the events preceding the seclusion and restraint, but often also the key seclusion and restraint decision-makers (Janelli et al. 1995). Another issue of concern in our study emerged from a legal dilemma in cases of nurse-initiated seclusion or restraint when the physician was not immediately informed and thus joined the process with a substantial delay. This issue obviously requires a review of the guidelines and a recurring update of the division of labour between physicians and nurses. For the nurses, other ethical problems that caused frustration and feelings of guilt were the inability to always find alternatives to and thus the use of seclusion and restraint, and the amount of time spent with secluded and restrained patients, which inevitably decreased the amount of time spent with other patients. These findings also concurred with those of earlier studies (Janelli et al. 1995, Marangos-Frost & Wells 2000). As a means to lighten the ethical burden, nurses and physicians highlighted the importance of multi-professional team work and a need for training and supervision in multi-disciplinary teams. Debriefing with the patient after seclusion or restraint was also described as useful, but seldom occurred. All these findings confirm earlier reports, too (Lee et al. 2001, Vuokila-Oikkonen et al. 2003, Needham & Sands 2010). This poses a challenge to nursing managers and chief medical officers, whose role in achieving favorable changes in seclusion and restraint use is essential (Gaskin et al. 2007).

Nursing and medical personnel described 1) nursing interventions, 2) multiprofessional agreements involving the patient, and 3) the use of authority and power as,

chronologically the first, second and third step measures. The first two approaches were defined in earlier studies as collaborative practices (Lee et al. 2001, Smith et al. 2005). Step three seems to be rather a paternalistic than a collaborative practice, since the reliance on manpower (e.g. physical force), especially that of male nurses, is not consonant with the active role of the patient mentioned by our interviewees. In fact, some earlier studies have reported that these manpower-oriented practices (Alexander 2006) may actually exacerbate a patient's aggressive behaviour (Olofsson & Nordberg 2001). An ongoing discussion within the profession is needed to keep this use of power under scrutiny and find better solutions to empower the patients without compromising security on the wards. Otherwise the declared high ethical principles may remain theoretical and not be realised clinical nursing.

In our study, the participants mentioned the importance of clinical experience-based tacit knowledge on seclusion and restraint and the confidence built up among personnel who have worked together for a long time. In fact, reliance on tacit knowledge and a shared common experience may be not only a strength but also a weakness. It may also undermine the development and impede desirable changes in the treatment methods and surrounding nursing culture and practices. This finding highlights again a need for training on an evidence based approach to clinical nursing (NICE 2005, Means et al. 2009, Paavilainen & Flinck 2008, Häggman-Laitila 2010, Melender & Häggman-Laitila 2010). There is obviously a need for more patient-centred nursing, where personnel is trained to tune in to the reason for a patient's aggressive behaviour and where alternatives to seclusion and restraint are negotiated with the patient and written into his/her treatment plan. Nurses are in a key role not only in delivering information regarding aggressive patients, but also as seclusion and restraint decision-makers. Therefore, more interaction between nurses and physicians is needed to shift the focus from seclusion and restraint to alternative, less restrictive and more collaborative methods. In addition to existing seclusion and restraint-related treatment directives, there seems to be a need for structured, evidence based guidelines on the prevention and de-escalation of aggressive behaviour in psychiatric care. Their implementation could become an essential component of pertinent vocational education programmes. In addition, in the ethically demanding work of psychiatric nursing it is important to ensure personnel's well-being and thereby to avoid work-related stress (Robinson et al. 2003). Continuing vocational education, managerial support and employee coaching are all means to reduce work-related stress and thus prevent cynicism and burn-out among personnel (Robinson et al. 2003, Gilbody et al. 2006).

Nursing and medical personnel proclaimed the high ethical principles of their own seclusion and restraint mode of action, which was an especially intriguing finding in light of the notoriously high seclusion and restraint rates in Finland (Salize et al. 2002, Tuohimäki 2007). Moreover, in seclusion and restraint situations the participants appeared to rely heavily on manpower, especially on male nurses, which pointed towards paternalistic rather than collaborative practices (Alexander 2006, Björkdahl et al. 2010). Hence, it seems that the declared ideal humane mode of action and current seclusion and restraint practices in these psychiatric hospitals may not always match. Regardless of treatment guidelines or tacit knowledge, all declared respect for patients' dignity as an important issue in their own current mode of action. This finding

questions the value of written guidelines alone, since without appropriate education they seemed not to yield any additional benefit for the personnel's understanding of its own procedures. Also, there appeared to be excessive reliance on intuition and clinical experience-based tacit knowledge, which obviously requires an evidence based approach for managing these situations in nursing practice (NICE 2005, Guidelines International Network 2008, Means et al. 2009, Häggman-Laitila 2010) and to bridge the gap between best available evidence and practice (Bero et al. 1998, Finnish Medical Society Duodecim 2008, Paavilainen & Flinck 2008).

The nursing and medical personnel in our study did indeed acknowledge a need for continuing practical on-ward education on seclusion and restraint, which, according to earlier reports (Lee et al. 2001) can improve clinical practices. Since seclusion and restraint are ethically, clinically and legally demanding interventions, our participants expressed a need for training based on ethically, clinically and legally problematic case scenarios, as also did the personnel in some earlier studies (Marangos-Frost & Wells 2000, Olofsson 2005, Sclafani et al. 2008). Such problem-based education has been reported to be effective (Suen et al. 2006). Our interviewees also emphasised a need for training in multidisciplinary teams, which, according to the literature, can indeed reduce the number of seclusion and restraint incidents (Curran 2007).

In addition to the needs for education, the nursing and medical personnel in our study were aware of a need for support to be able to practise seclusion and restraint successfully. The nurses mentioned the importance of occupational health care as a means of managerial support. This is in line with the benefits of such support reported earlier in nursing practice (Wand & Coulson 2006). Also, the support and supervision of seclusion and restraint situations by peers and directors mentioned by our participants may in fact reduce seclusion and restraint incidents (McCue et al. 2004), improve personnel well-being and satisfaction, and furthermore, decrease exhaustion among the personnel (Griffiths 2001, Gilbody et al. 2006). Education and support grossly overlap on the ward level but their mutual interaction in nursing practice has not earlier been explored. Development of support means in parallel with the personnel's educational programmes could yield an additional beneficial effect in seclusion and restraint practices.

6.2.3. Impact of a continuing vocational eLearning course on nurses' professional competence in seclusion and restraint practices

No data is available on eLearning in mental health focused on seclusion and restraint, although conventional lecture-based education can positively affect nurses' knowledge about physical restraint (Suen et al. 2006, You & Pank 2006, Huang et al. 2009). Similarly, in our study knowledge of coercion-related legislation increased as expected in the ePsychNurse.Net group. Interestingly, our findings on knowledge about physical restraint and on seclusion were contradictory. The improved knowledge of physical restraint in both groups could be explained by efforts of organisations to change coercive practices via continuing education beyond the ePsychNurse.Net – a confounding factor that, for ethical reasons, could not be eliminated on the control

wards. It may also be that due to its emphasis on somatic aspects, physical restraint is more straightforward and simpler to learn than seclusion, with its less precise body of knowledge (Suen et al. 2006, Huang et al.2009).

As in earlier studies with conventional learning techniques (Suen et al. 2006, Huang et al. 2009), ePsychNurse.Net had no impact on nurses' attitudes to physical restraint. This is not surprising since, as Kirkpatrick (1998) argues, change in attitudes and in work practices requires at least one year. Moreover, enduring changes in personnel attitudes may require simultaneous use of several different interventions (Bowers et al. 2006, Gaskin et al. 2007). Our study's three-month time span may have been too short for the nurses to internalise the new attitude. The surprising improvement in attitudes to seclusion in the control group but not the intervention group could most likely result from the noticeable shrinking of the control group and a consequent bias – the participants who were more interested in the development of seclusion and restraint practices and relevant ethics were more likely to attend the follow-up session, while those with initially less favourably disposed might drop out more readily.

The use of eLearning may cause some resistance (Cobb 2004), ambivalence or even negative perception in general (Morris-Docker et al. 2004) and particularly in psychiatry, where intelligent technologies are still less common than in other sectors (Ruiz et al. 2006). Hence, the eLearning course as such might diminish job satisfaction. However, the ePsychNurse.Net had no negative impact on our nurses' job satisfaction despite the course-related exceptional time pressure. To reduce the overall burden of the programme, a focused application of different elements of the ePsychNurse.Net might in future be considered to adjust the course to rather individual than group needs. A more flexible time schedule might also be advisable. In future, when the role and proportion of eLearning in continuing vocational education increase and become routine (Ward et al. 2008.), the burden will likely diminish and the effects of eLearning on job satisfaction will improve.

The strengthening of the perceived general self-efficacy in the ePsychNurse.Net group, but not in the control group supported the initial hypothesis and corroborated earlier studies. E.g., Docherty et al. *(*2005) reported that using multimedia learning objects and technology as well as peer-group encouragement were essential elements of students' improved general self-efficacy in eLearning.

The ePsychNurse.Net group revealed positive within group changes on all variables studied except seclusion-related knowledge and attitude. The lack of statistically significant differences in changes between groups on almost all variables could be a sign of ineffectiveness of the eLearning technique, failure to adjust the course to individual needs, too little time for successful assimilation of the massive body of new knowledge and especially attitudes proposed by the course, too rigid time frames of the study, or inadequacy of the content of the course for seclusion or restraint-focused education.

6.3. Conclusions and implications of the study

6.3.1. Conclusions

According to the research findings, the following areas where clinical nursing could be improved regarding seclusion and restraint practices were identified:

1. The patient perspective must be accentuated. To raise the threshold for seclusion and restraint, more humane alternatives should be available and offered. This can be achieved by providing patients with meaningful activities, planning beforehand, documenting the patient's wishes, and making patient-personnel agreements. If a patient still needs seclusion or restraint as a last resort, his or her basic needs have to be met and patient-personnel interaction has to continue during seclusion and restraint. Improvements for patients in the development of inpatient management and educational programmes are crucial.

2. To ensure personnel's professional competence and thereby to diminish or replace the restrictions, there is a need for written clinical guidelines on alternative treatment approaches. Furthermore, personnel need problem-based, on-ward education to promote communication with a patient. More specifically, education should focus on sensitisation to patients' feelings and interpersonal aggression-precipitating factors. Moreover, personnel need infrastructural and managerial support on restriction-related ethical and legal issues.

3. Continuing vocational education should bring together written clinical guidelines, education on ethical and legal issues, and support for personnel. To achieve the ambitious goal of such integration, achievable and affordable educational programmes are required. This, in turn, implies a call for innovative learning methods. The ePsychNurse.Net might offer such an innovation.

The conclusions of the study are described in Figure 2.

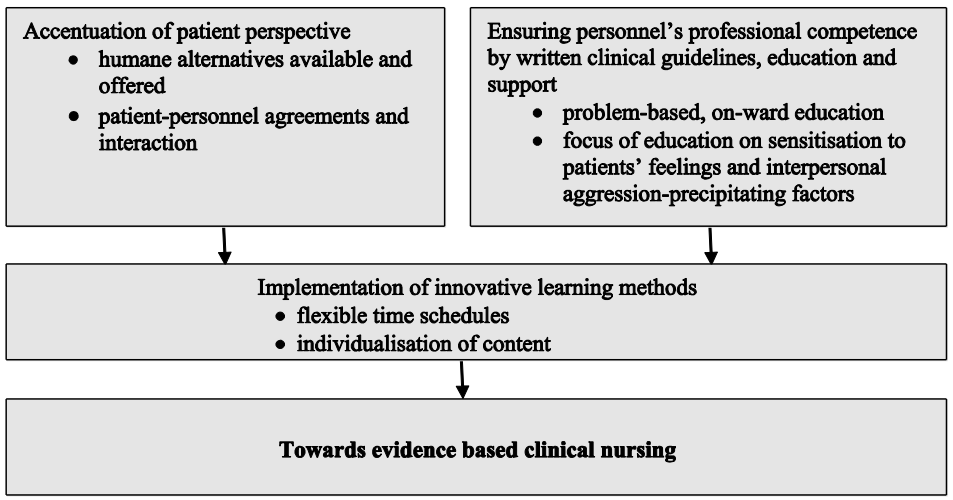

Figure 2. Conclusions of the study

6.3.2. Implications

The study has implications for different fields including clinical nursing, nursing education, management and nursing science:

1. In clinical nursing, the study enriched the body of knowledge on patients' experiences and suggestions and personnel's perceptions regarding seclusion and restraint practices. Patients' experiences were mostly negative. Patients had problems for example in basic needs and interaction with the personnel. Based on this knowledge, alternatives to seclusion and restraint were elucidated that must be stressed in further development: proactive reflection on a patient's frustration and fears. Especially challenging but at least equally necessary is developing means of interaction with patients with severe cognitive impairments and patients from different ethnic background.

2. In the field of nursing education, educational needs of the personnel located in the present study served as basis for building up a novel education programme. Patients' experiences and suggestions of seclusion and restraint practices had elements which need to be taken into account in nurses' basic education and continuing vocational education programmes. Nurses' knowledge about e.g. pharmacological and legal issues related to seclusion and restraint needs to be enhanced. This gives nurses better possibilities to inform patients in challenging situations. Moreover, the research findings offer knowledge on the impacts of the innovative learning methods on nurses' professional competence in seclusion and restraint practices.

3. Regarding nursing management, the research findings can be used to implement continuing vocational education to ensure personnel's professional competence. Organisations' management has an important role in ensuring the continuing systematic vocational education and training for personnel. In this study the continuing vocational education (eLearning course) was integrated into organisations' strategic management and nursing and medical personnel's educational needs regarding seclusion and restraint practices were taken account. The novel education programme ePsychNurse.Net has been tested and preliminary results support its further development and implementation which will plausibly lead to decrease the use of seclusion and restraint. The study findings indicate a need for profound changes in both the seclusion and restraint culture and administrative control for the current - sometimes unacceptable - practices. This poses a challenge to nursing managers and chief medical officers, whose role in achieving favorable changes in seclusion and restraint use is essential.

4. Regarding implications for nursing science, the study generated evidence based knowledge base on innovative learning methods to ensure professional competence in seclusion and restraint practices in psychiatric nursing. Including both patients' and personnel's perspectives yields a complete picture of the seclusion and restraint practices and educational needs in psychiatric hospitals. The use of different designs and data collection methods enabled us to gain a

wide perspective on clinical nursing and innovative learning methods to ensure professional competence in seclusion and restraint practices.

6.4. Suggestions for further research

The following research ideas emerged from this study:

1. Patients' perspective should be explored as mirrored in the contemporaneously investigated personnel perspective to indicate specific elements of the seclusion and restraint practices to be improved (e.g. through future educational programmes). This two-dimensional view would likely reveal some aspects of patient restrictions and alternatives to seclusion and restraint which are not salient in daily clinical nursing. Moreover, interviewing pooled groups comprising patients, nurses and physicians together could generate additional insights regarding improved clinical nursing. To finalise the comprehensive multidimensional picture, perceptions of bystander patients having witnessed seclusion and restraint episodes could be possibly explored, too – an approach that so far has accumulated no evidence whatsoever.

2. There is a need to study multi-professional approaches to alternative interventions in the treatment of aggressive in-patients. These diverse information sources seem to provide a more comprehensive multi-dimensional picture of patient restrictions and alternative approaches.

3. Future research should bring together written clinical guidelines, ethical and legal issues and the personnel's support aspect using mixed research techniques and methods.

4. The innovative eLearning course ePsychNurse.Net needs to be studied with instruments developed for the psychiatric setting that are still lacking and to focus on the course with content and duration tailored for individual needs. Moreover, ePsychNurse.Net needs to be studied with a longer follow-up to examine the long-term impacts, using the Kirkpatrick's Four Levels' Model in the evaluation.

5. There is an obvious need for a randomised controlled trial, which means randomisation of hospital wards to either implement preventive interventions or carry out practice as usual, to assess the effectiveness of prevention programmes to reduce the use of seclusion and restraint. Prevention programmes would include empowering service users, ensuring mental health care professional competence with innovative learning methods, executive leadership, practical tools and techniques (e.g. Early Recognition Method).

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Appendix 1

Table. The Search History of the Literature Review by Medline

Ovid MEDLINE(R)
1966 to April Week 4 2006 (1)

#	**Search History**	**Results**
1	Patient Isolation/	1979
2	psych$.mp.[rnp=title,original title, abstract, name of substance word, subject heading word]	631371
3	1 and 2	355
4	Restraint, Physical/	6988
5	seclusion$.mp. [mp=title, original title, abstract, name of substance word, subject heading word]	508
6	education/ or education, professional/ or exp education, continuing/or exp education, graduate/ or exp education, medical/ or exp education, nursing/ or exp inservice training/	171852
7	(3 or 4 or 5) and 6	100
8	**from7keepl-100**	**100**

Ovid MEDLINE(R)
1966 to October Week 2 2006 (2)

#	**Search History**	**Results**
1	Restraint, Physical/	7430
2	Patient Isolation/	2102
3	seclusion$.mp.	534
4	(mental$ or psychiatr$).mp. [mp=title, original title, abstract, name of substance word, subject heading word]	350109
5	l or 2 or 3	9576
6	4 and 5	1130
7	exp Heath Personnel/	261564
8	Attitude/	30847
9	”Attitude of Heath Personnel”/	59524
10	knowled$.mp. [mp=title, original title,abstract, name of substance word, subject heading word]	207452
11	exp Professional Competence/	47821
12	7 and (8 or 10)	16612
13	l2 or 9 or ll	111939
14	**6andl2**	**20**

Ovid MEDLINE(R)
1966 to October Week 2 2006 (3)

#	Search History	Results
1	"Attitude of Health Personnel"/	59524
2	exp Professional Competence/	47821
3	Health Knowledge, Attitudes, Practice/	32291
4	knowledge/	3688
5	Attitude/	30847
6	3 or 4 or 5	65753
7	exp Health Personnel/	261564
8	6 and 7	9600
9	(mental$ or psychiatr$).mp. [mp=title, original title, abstract, name of substance word, subject heading word]	350109
10	1 or 2 or 8	107626
11	10 and 9	9219
12	(patient$ adj2 right$).mp. [mp=title, original title, abstract, name of substance word, subject heading word]	10509
13	(human adj2 right$).mp. [mp=title, original tite, abstract, name of substance word, subject heading word]	10274
14	12 or 13	20416
15	11 and 14	107
16	limit 15 to (clinical trial or clinical trial, phase i or clinical trial, phase ii or cIinical trial, phase iii or clinical trial, phase iv or controlled clinical trial or evaluation studies or meta anaysis or multicenter study or randomized controlled trial or "review" or twin study or validation studies)	10
17	resear$.mp.	4739481
18	15 and 17	34
19	exp Research/	504979
20	15 and 19	9
21	exp Epidemiologic Methods/	2589941
22	l5 and 2l	35
23	((Objecti$ or aim$ or problem$ or purpos$ or topic$) and (desig$ or method$ or setti$) and (resul$ or findin$ or conclusi$)).mp.	875975
24	15 and 23	10
25	16 or 18 or 20 or 22 or 24	60

Ovid MEDLINE(R)
1966 to October Week 2 2006 (4)

#	Search History	Results
1	"Attitude of Health Personnel"/	59524
2	(attitud$ or opinio$).mp. [mp=title, original title, abstract, name of substance word, subject heading word]	224007
3	(mental$ or psychiatr$).mp. [mp=titIe, original title, abstract, name of substance word, subject heading word]	350109
4	(patien$ or perso$).mp. [mp=title, original title, abstract, name of substance word, subject heading word]	3396828
5	((attitud$ or opinio$) adj3 (mental$ or psychiatr$) adj3 (patien$ or perso$)).mp.	204
6	1 and 5	70
7	**from 6 keep 1-70**	**70**

Ovid MEDLINE(R)
1995 to September Week 2 2009 (5)

#	Search History	Results
1	(((effectiveness or clinical trial) and e-learning) or elearning or distant learning).mp. [mp0title, original title, abstract, name of substance word, subject heading word]	80