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EVALUATION OF AN E-LEARNING COURSE: COERCION PRACTICES IN PSYCHIATRIC NURSING

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To my family and loved ones

To all psychiatric nurses working out there

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ABSTRACT

The goal of the study was to evaluate an e-learning course entitled "Nursing interventions to manage distressed and disturbed patients" and intended for psychiatric nurses, using Kirkpatrick's evaluation model. The aim was to describe nurses' reactions, learning, behaviour change and impacts resulting from this e-learning course. This dissertation comprises four papers, and the data were collected 2008-2012 from three different sources; electronic databases, an e-learning platform and psychiatric hospitals.

First, a systematic literature review was conducted to understand the effectiveness of e-learning. Second, an RCT study was implemented to investigate the impact of the e-learning course on nurses' job-satisfaction, knowledge and attitudes (N=158). Third, to complete the picture of nurses views of the e-learning course related to knowledge transfer, the nurses' perspective was studied (N=33). Lastly, the effects of the e-learning course from nursing managers' perspective in psychiatric hospital organisations were studied (N=28).

The systematic review showed that although the nurses were satisfied with the e-learning, no effects were found in the RCT study of nurses' job satisfaction. The RCT study showed no effects on nurses' learning related to knowledge increase, but there was change in attitudes. The managers described the changes in the nurses' knowledge and attitudes. Among the nurses behaviour changed with knowledge transfer from the e-learning course to practice and they pointed out development issues related to their work. The final impacts of the e-learning course revealed advantages and disadvantages of the e-learning course and its implications for nurses' work.

This dissertation provides new insight into nurses' reactions, learning, behaviour change and impacts resulting from an e-learning course in their continuing education. In order to improve nurses' continuing education systematic evaluation is needed, for which Kirkpatrick's evaluation model is a useful tool.

Keywords: psychiatric nursing, e-learning, continuing education, Kirkpatrick's evaluation model

Mari Lahti

VERKOSSA TAPAHTUVAN TÄYDENNYSKOULUTUKSEN ARVIOINTI: RAJOITTAMISTOIMET PSYKIATRISESSA HOITOTYÖSSÄ

Hoitotieteen laitos, Lääketieteellinen tiedekunta, Turun yliopisto, Turku, Suomi

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TIIVISTELMÄ

Tutkimuksen tavoitteena oli arvioida psykiatrisille sairaanhoitajille suunnattua verkkokurssia ”Levottomien ja aggressiivisten potilaiden hoito”. Arvioinnin viitekehyksenä toimi Kirkpatrikin arviointimalli. Tavoitteena oli kuvata sairaanhoitajien reaktioita, oppimista, käyttäytymisen muutosta ja verkkokurssin vaikutuksia psykiatriseen hoitotyöhön. Tämä väitöskirjatutkimus jakaantui neljään vaiheeseen ja aineiston keruu sijoittui vuosien 2008–2012 väliselle ajalle. Aineisto kerättiin kolmesta eri lähteestä: elektronisista tietokannoista, verkkokurssilta ja psykiatrisista sairaaloista.

Ensimmäisessä vaiheessa selvitettiin kirjallisuuskatsauksen avulla verkko-opiskelun vaikuttavuutta. Toisessa vaiheessa tutkittiin vaikuttavuustutkimuksen avulla verkkokurssin vaikutuksia sairaanhoitajien työtyytyväisyyteen, tietoon ja asenteisiin (N=158). Kolmannessa vaiheessa tarkasteltiin sairaanhoitajien näkökulmasta tiedon siirrettävyyttä verkkokurssilta käytäntöön (N=33). Neljännessä vaiheessa psykiatristen sairaalaorganisaatioiden esimiesten näkökulmasta tutkittiin verkkokurssin vaikutuksia käytännön hoitotyöhön (N=28).

Kirjallisuuskatsaus osoitti, että sairaanhoitajat olivat tyytyväisiä verkkokurssiin, mutta työtyytyväisyyteen sillä ei ollut vaikutusta vaikuttavuustutkimuksen mukaan. Verkkokurssi ei edesauttanut tilastollisesti merkitsevän tuloksen syntymistä oppimisen eli tiedon lisääntymisen näkökulmasta vaikuttavuustutkimuksen mukaan, mutta asenteiden kohdalla tilastollisesti merkitsevää eroa havaittiin. Hoitotyön esimiehet kuvasivat muutosta hoitajien tiedoissa ja asenteissa. Hoitajat pystyivät siirtämään tietoa verkkokurssilta käytäntöön ja he esittävät kehittämisehdotuksia työhönsä liittyen. Hoitotyön esimiesten näkökulmasta verkkokurssin tuloksena saavutettiin etuja ja haittoja sekä vaikutuksia käytännön työhön.

Tämä väitöskirja tuottaa uutta tietoa sairaanhoitajien verkkokurssin jälkeisiin reaktioihin, oppimiseen, käyttäytymiseen ja tuloksiin. Sairaanhoitajien täydennyskoulutuksen systemaattinen arviointi on tärkeää, jotta jatkossa voidaan kehittää paremmin sopivia täydennyskoulutuskursseja. Kirkpatrikin arviointimalli on sopiva arvioinnin työkalu hoitotyön alueella.

Avainsanat: psykiatrinen sairaanhoitaja, verkko-opetus, täydennyskoulutus, Kirkpatrikin arviointi malli

TABLE OF CONTENTS

LIST OF FIGURES AND TABLES

FIGURES

TABLES

ABBREVIATIONS

ANOVA	Analysis of variance
CI	Confidence Interval
CINALH	Cumulative Index for Nursing and Allied Health Literature
CONSORT	Consolidated Standards of Reporting Trials
COREQ	Consolidated criteria for reporting qualitative research
ETENE	National Advisory Board on Social Welfare and Health Care Ethics [Valtakunnallinen sosiaali- ja terveysalan eettinen neuvottelukunta]
EU	European Union
ICT	Information and Communication Technology
MD	Mean Difference
OECD	Organisation for Economic Cooperation and Development
PRISMA	Preferred Reporting Items for Systematic Reviews and Meta-analyses
QUOROM	Quality of Reporting of Meta-analysis
RCT	Randomised Controlled Trial
REVMAN	Review Manager
SD	Standard Deviation
SPSS	Statistical Package for the Social Science
TENK	Finnish Advisory Board on Research Integrity [Tutkimuseettinen neuvottelukunta]
TUKIJA	National Committee on Medical Research Ethics [Valtakunnallinen lääketieteellinen tutkimuseettinen toimikunta]
WHO	World Health Organization

LIST OF ORIGINAL PUBLICATIONS

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

I Lahti M., Hätönen H. & Välimäki M. 2012. Impact of e-learning on nurses' and student nurses knowledge, skills, and satisfaction: A systematic review and meta-analysis. International Journal of Nursing Studies 51, 136 – 149.

II 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 18 (9), 813 – 821.

III Lahti M., Kontio R., Pitkänen A. & Välimäki M. 2013. Knowledge transfer from an e-learning course to clinical practice. Nurse Education Today 34, 842 – 847.

IV Lahti M., Kontio R. & Välimäki M. 2013. Impact of e-learning course to clinical practice in psychiatric hospitals: nurse managers' point of views. Submitted.

1. INTRODUCTION

Mental health has been defined as "a state of well-being in which the individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to his or her community" (World Health Organization 2004, p. 23). Despite this positive sound definition, mental health related problems in the European area are causing an enormous burden on society (WHO 2011). It is estimated that every year over 38.2% (164.7 million people) in the European population are affected by mental health problems (Wittchen et al. 2011). The prevalence of suffering from mental health problems has stayed almost the same over the years (Wittchen & Jacobi 2005, Wittchen et al. 2011). However, the burden of mental health disorders alone is causing billions of Euro's loss to societies worldwide (McInnis & Merajver 2011, Whiteford et al. 2013). The three most common mental health disorders causing the biggest burden across all age groups are anxiety disorders, unipolar depression and insomnia (Wittchen et al. 2011). In Finland the most common mental health disorders in psychiatric hospital care were schizophrenia, depression and bi-polar mood disorder and almost 160,000 inhabitants used specialised psychiatric health care services in 2011. There were over 1.4 million treatment days in special psychiatric health care units and altogether over 40,000 treatment episodes. Of these episodes, 22% were admitted to psychiatric wards using involuntary admission. (Rautiainen & Pelanteri 2013.) Nurses are the biggest health care professional group taking care of and planning the care of patients suffering from mental health problems (WHO 2011). Therefore, to be able to offer good patient care in the field of mental health care, the focus needs to be put on the continuing education of psychiatric nurses.

Nursing in the future will be increasingly technical and therefore the role of continuing education is increasing (National Research Council 2011). Continuing education has been taken as an essential way to develop a person's professional skills (European Commission 2010, Council of the European Union 2011). In mental health nursing there is also a need for lifelong learning (Ryan-Nicholls 2003, WHO 2007) and a need to upgrade mental health workers' skills and knowledge (Robinson & Tingle 2003, Jones and Lowe 2003, WHO 2005, WHO 2007). This is important because it has been estimated that every fourth person will suffer from mental health problems in adulthood within a one-year period (Wittchen et al. 2011). Hence, continuing education in mental health is important to maintain and increase nurses' knowledge, skills and knowledge transfer to practice (Cleary et al. 2011). In order to provide the best patient care recommended (WHO 2005), health care professionals should invest in educational opportunities that give them up-to-date knowledge and skills (WHO 2011). The National Research Council of USA (2010)

stated that continuing education should be carried out using new technologies such as e-learning to offer tailored course packages to individuals to fill their knowledge gaps.

In this agenda an open continuing education environment is important to ensure lifelong learning in health care (European Commission 2010). Therefore the European Union has established an e-learning action plan which underlines the importance of an open continuing education environment to ensure lifelong learning (Commission of the European Communities 2001, The European Commission (2011) has set as one of its priorities to enhance the use of Information and Communication Technology (ICT) and it is stated in the e-learning action plan that all higher education units should make this one of their main priorities in the field of education to ensure lifelong learning (Commission of the European Communities 2001). e-Learning and its use in education is still fairly new way of learning and is highlighted across European countries (Digital Agenda Assembly 2011, 2013). The use of e-Learning has increased significantly (Commission of the European Communities 2003, Cook et al. 2008) and same trend is to be seen in the health care field, where the internet has expanded new opportunities like e-learning offering an adaptable, suitable and interactive form of education (Wutoh, et al. 2004, Belcher & Vonderhaar 2005, Cook, et al. 2010, 2008). The use of e-learning has spread rapidly, especially in health care (Cook et al. 2010) and it is seen as an important aspect of today's health care education (Ruggeri et al. 2013). However, there is need for systematic evaluation of e-learning courses (Curran & Fleet 2005, Leung et al. 2013).

In the literature e-learning course evaluation is mostly reported in terms of course outcomes such as satisfaction, knowledge and skills and attitudes (Chumley-Jones 2002, Cobb 2004, Lewis et al. 2005, Curran & Fleet 2005, Curran et al. 2006). However, attention should also be paid to the evaluation of knowledge transfer and behavioural change (Curran & Fleet 2005, Leung et al. 2013). It is not known how knowledge acquired through continuing education is transferred to daily nursing. Therefore the focus of research should shift towards an evaluative approach in order to demonstrate the benefit of continuing education to clinical practice (Lauder et al. 1999). Transfer of knowledge is seen as a main goal in lifelong learning (Jackson et al. 2009) and has major implications for health care practice in achieving skilled nurses (Bleich et al. 2009). Although the benefits of e-learning have been shown in several studies (Wutoh et al. 2004, Cook et al. 2008), information is still lacking on how e-learning continuing education is experienced by nurses (Wilkinson et al. 2004) and how knowledge is transferable to daily practice (Bleich, et al. 2009). Moreover, evaluation from the organisational perspective is lacking (Raymond et al. 2012).

The overall goal of this doctoral dissertation was to use Kirkpatrick's evaluation model to evaluate an e-learning course intended for nurses working in the psychiatric field. Kirkpatrick's evaluation model offers a systematic approach to comprehensive course

evaluation. (Kirkpatrick & Kirkpatrick 2006). It has been used extensively for over three decades (Allinger & Janak 1989, Kirkpatrick 1996, Bates 2005, Galloway 2005, Kirkpatrick & Kirkpatrick 2006). Kirkpatrick's theoretical model includes four levels of evaluation focusing on students' reactions, learning, behaviour change and the results of education courses (Kirkpatrick & Kirkpatrick 2006). In this dissertation the focus of the evaluation was nurses' reactions, learning as knowledge, skills and attitudes, behaviour change as knowledge transfer and the results of an e-learning course. More specifically, this study focused on an e-learning continuing education course intended for psychiatric nurses. The target group of the study was nurses working in psychiatric hospitals and nursing managers from psychiatric hospital organisations. This doctoral dissertation is a part of the European Commission funded project (ePsychNurse.Net; Leonardo Da Vinci FI-06-B-F-PP-160701), in which six European countries participated (Finland, England, Ireland, Italy, Lithuania, Portugal). The ePsychNurse.Net project was intended to ensure high quality, ethically appropriate and therapeutically effective nursing interventions to enable nurses to handle distressed and disturbed patients in psychiatric hospitals in the European area. The purpose of the ePsychNurse.Net project was to develop on the basis of a needs analysis among qualified nurses an e-learning continuing education course related to the management of distressed and disturbed patients in psychiatric hospitals and inpatient units. The e-learning course described in this study, ePsychNurse.Net, was developed during the EU project. (Välimäki et al. 2008.)

This doctoral dissertation is in the field of nursing science. More specifically, psychiatric nurses' e-learning continuing education related to managing distressed and disturbed patients in mental health nursing. More specifically, the dissertation focuses on e-learning continuing education related to handling aggressive patients in the psychiatric hospital environment in a more ethically appropriate way, with special reference to the work of psychiatric nurses and nursing managers.

2. OVERVIEW OF THE LITERATURE

2.1 Mental health services, treatment and personnel in Finland

2.1.1 Mental health services

Mental health services in Finland have gone through an extensive reform in the last century (Pirkola et al. 2007, Välimäki et al. 2008, Tuori 2011, Pylkkänen 2012, Westman et al. 2012). At the same time in the Western world the role of mental health services shifted from hospital based to community based treatment as part of the deinstitutionalization of psychiatric care and treatment (Pirkola et al. 2007, Priebe et al. 2008, Hamden et al. 2011, Westman et al. 2012). At the time of the Finnish deinstitutionalization most of the psychiatric services and beds were in psychiatric hospitals and outpatient care was still a minor service form (Tuori 2011, Pylkkänen 2012). During the 1970s in Finland the reform of psychiatric services started as part of organisational changes in health care (Tuori 2011, Pylkkänen 2012) and a massive reduction by 75% in the number of psychiatric hospital beds took place in the period 1970-1990 (Pylkkänen 2012, Westman et al. 2012). This reduction of hospital beds within a thirty-year period leaves one fifth of the psychiatric beds from the 1970s and nowadays there is an average 4000 hospital beds in psychiatric hospitals, amounting to 0.8 % of all hospital beds (Tuori 2011). At the same time psychiatric inpatient days declined dramatically (Pirkola et al. 2007). In the 1980s there were over 5,500 patients hospitalised over a two-year period in psychiatric hospital and this was reduced to 560 in the period 1982-2009 (Tuori 2011). In the 1990s in Finland the change in mental health services was extended by a new Mental Health Act (1116/1990) intended to improve psychiatric services (Tuori 2011, Pylkkänen 2012). Moreover, psychiatric services were merged with other secondary level health care services in 1991 and the municipalities were given the responsibility to provide and fund mental health services (Westman et al. 2012).

Mental health services in Finland are provided by the municipalities (=320) in primary health care and specialised health care (Halonen 2013). The municipalities organise preventive health and social care for mental health disorders, early diagnosis and treatment (Ministry of Social and Health Affairs 2013). The municipalities provide health care services for mental health in primary health care at health centres and in secondary health care in hospital districts (Vuorenkoski & Wiili-Peltola 2007). Specialised medical care is provided by hospital district hospitals owned and run by joint authorities; there are 20 hospital districts, five of them university hospital districts. Access to specialised psychiatric care requires a referral from a health centre physician or private practitioner. (Association of Finnish Local and Regional Authorities 2013.)

Mental health services in primary health care are provided by health care centres where there is an opportunity for inpatient care on a psychiatric ward (Rautiainen & Pelanteri 2012). The trend in Finland in recent decades has been for mental health care to be centred in primary health care units instead of specialised psychiatric hospitals (Tuori 2012) and same trend is also apparent at the European level (Csipke et al. 2013). Outpatient care is organised in primary health care and partly in specialised health care (Ministry of Social and Health Affairs 2013). The trend in Finland to use outpatient care in mental health field has increased steadily over the last ten years (Vainiola & Vainikka 2011) and same is apparently the case throughout Europe since deinstitutionalization (Happell et al. 2012). Mental health outpatient visits in Finland, in primary health care reached almost 700,000 and the majority (86%) of these involved a health care professional other than a medical doctors (Vainiola & Vainikka 2011). However, in Finland there is a relatively long waiting time for a consultation with a medical doctor in primary health care, around 2-12 weeks (84%) depending on the acuteness of the situation, but an outpatient consultation with a nurse is possible in around one week (82%) (National Institute for Health and Welfare 2013). Inpatient mental health services are also organised in specialised health care in psychiatric hospitals and clinics (Ministry of Social and Health Affairs 2013). Treatment days in specialised psychiatric care in year 2010 amounted to approximately 1.5 million and over half of these were used to treat schizophrenia patients. Moreover, among new patients in specialised psychiatric care one third were admitted on an involuntary basis. (Rautiainen & Pelanteri 2012.)

Mental health care services are regulated by the Mental Health Act (1116/1990) and the Health Care Act (1326/2010). The Mental Health Act provides the rules for the services, care and treatment applicable to people dealing with mental health problems (Mental Health Act (1116/1990)). The Mental Health Act is a core law which regulates mental health work, its concepts and also regulates the obligations to organise mental health services (Harjajärvi et al. 2006). The main obligations stipulated for mental health care in the Mental Health Act (1116/1990) include that services must meet the needs of the population, services provided by different sectors need to be integrative, and outpatient care must be a priority (Pylkkänen 2012). Mental health services are also regulated by the Health Care Act (1326/2010) stipulating that mental health services and substance abuse services are to be provided in primary health care at municipality level.

There has been no national consensus of common aims for mental health policy in Finland (Pylkkänen 2012), until the publication in 2009 of the MIELI plan (Tuori 2011). The Ministry of Social Affairs and Health is responsible for national policies and strategic planning and has been producing the national plan for mental health and substance abuse work – MIELI 2009, setting the main priorities for the future of mental health and substance abuse work until 2015 (Tuori 2011). The MIELI plan includes four core principles related to the role of service users, focusing on prevention and promotion,

developing assessment tools, and organising mental health and substance abuse services into well-functioning services (Ministry of Social Affairs and Health 2009). The MIELI plan emphasises the need to organise mental health services in outpatient care and provide more easy-access treatment services for mental health clients (Morig et al. 2012).

As there have been major changes in psychiatric services in Finland and patients in psychiatric hospitals are even more challenging and facing many problems, this has led to changes in the demands on nurses' work (Rautiainen & Pelanteri 2013, Välimäki et al. 2013). Therefore, more emphasis should be placed on mental health care personnel and their continuing education that they can keep up with these existing challenges (Ryan-Nicholls 2003, Wright et al. 2011). Moreover, even though psychiatric services are delivered in many forms this study focuses on psychiatric hospital settings and psychiatric nurses' continuing education because these nurses are facing more challenging issues, for example, dealing with aggressive patients.

2.1.2 Mental health treatment and coercive practices

Even though psychiatric outpatient care has developed, a number of patients still need psychiatric inpatient care due to their mental illness and the danger they pose to themselves or others (Salize & Dressing 2004). Psychiatric treatment and care raise several ethical questions, as many patients are admitted to care against their own will (Rautiainen & Pelanteri 2012). Ethical issues emerge when the discussion turns two-way into one-way in decision-making between patients and health care personnel (Pelto-Piri et al. 2013). In psychiatric care one ethically sensitive topic is the use of coercion and patient autonomy and therefore nurses are constantly balancing between legal and ethical issues in an effort to protect the patient from harm while respecting his/her autonomy (Janelli et al. 2006). The use of interventions restricting freedom, such as seclusion and physical restraint are ethically sensitive measures encroaching on human rights and human dignity during a patient's stay in psychiatric hospital (Duxbury 2002, Kuosmanen 2009, Steinert et al. 2010). Thus, mentally ill people face stigmatisation, discrimination, violation of their human rights, and this challenges the fundamental European values (European Commission 2005).

Nurses may feel ethical challenges related to the use of freedom restricting measures, such as seclusion, restraint and forced medication. Moreover it seems that female nurses and nurses working on acute wards are facing more ethical issues related to the use of coercive practices. (Lind et al. 2004.) From a service user's perspective these freedom restrictive measures also may cause stress and disempowerment (Quirk et al. 2004). Yet, patients acting aggressively are causing serious risks to patients' and nurses' safety and therefore freedom restricting measures are used in many countries to prevent this risk (Kontio et al. 2013). Even thought, seclusion has been said to represent a therapeutic

intervention providing 'asylum' in order to control the patient's behaviour. On the other hand, it can be seen as one form of punishment. (Brown & Tooke 1992.) There is also a debate going on in psychiatric care about the non-therapeutic effects of these freedom restrictive measures, such as negative cognitive changes related to sensory deprivation, the lack of opportunity for normal social interaction, negative changes in daily routines, resentment and a restriction of an individual's right to freedom (Keski-Valkama et al. 2010). Moreover, Soininen et al. (2013) showed that patients felt coercive practices unnecessary and unsatisfactory and they hoped that nurses would take patients' opinions into account when deciding on the treatment and care.

In mental health care treatment may be voluntary or involuntary. In Finland involuntary treatment is above the European average (Salize & Dressing 2004, Steinert et al. 2010). In Europe the statistics on coercive measures vary widely between countries (Raboch et al. 2010). Patients in mental health care may also be treated against their own will and their right to self-determination may be ignored, but they may also be subjected to measures restricting their freedom during their stay in hospital (Välimäki et al. 2001, Keski-Valkama et al. 2010). However, recent data from Finland suggest that the amount of involuntary treatment has slightly decreased (Rautiainen & Pelanteri 2013). The Ministry of Social Affairs and Health (2009) has outlined the need to reduce the use of seclusion and restraint by as much as 40% by 2015. In Finland in 2011 the share of patients undergoing involuntary treatment on psychiatric hospital wards was 31%. Of these 1,622 were admitted to in the seclusion room (6.2%), restraint belts were used on 766 patients (2.9%), involuntary medication was administered to 570 patients (2.2%) and 436 patients (1.7%) were subjected to physical holding (Rautiainen & Pelanteri 2013).

To be able to reduce the use of different freedom restrictive measures in Finland, recent studies (Soininen et al. 2013, Kontio et al. 2013) are suggesting that the focus should be placed on nurses' education related to the use of alternative methods and ethically appropriate ways to deal with aggressive patients. Therefore this study focuses on nurses working in the psychiatric hospital setting, and their continuing education related to the care of distressed and disturbed patients.

2.1.3 Personnel in mental health field

Nurses constitute the largest health care personnel's group (Organisation for Economic Cooperation and Development (OECD) 2012). In 2010 there were over 19.3 million nurses working globally (WHO 2011). In Finland there were over 75,000 registered nurses and over 110,000 practical nurses working in different areas of health care. Nurses' mean age in Finland is 43 and most of the nurses are female (89%). (Ailasmaa 2013.) Higher income countries tend to have more nurses working in mental health than

do lower income countries (WHO 2007). Moreover, nurses are the key staff resource to produce psychiatric and mental health care for the patient (WHO 2007, Barret et al. 2009). In Finland the number of psychiatrists and mental health nurses is high compared to the European level (Tuori 2011). At European level most of the psychiatric nurses work in psychiatric hospitals or psychiatric units in general hospitals (WHO 2007). In Finnish psychiatric hospitals there are two types of qualified nurses; registered nurses and practical nurses (e.g. mental health nurse in the earlier education system) (Kontio 2011). Psychiatric services in Finland include several professional groups licensed and supervised by the National Supervisory Authority for Welfare and Health (Valvira 2013). However, nurses in the mental health field play a critical role in delivering and being responsible for the care of people suffering from mental illnesses (WHO 2007).

Nurses' role and teamwork in mental health nursing is built on understanding people with mental health problems (Holm & Severinsson 2011). Nurses tend to have a critical role in caring for patients in mental health units (WHO 2007). Moreover, nurses in mental health care have to deal with complex issues and they have to take care of administrative responsibilities but also direct patient care (Barrett et al. 2009). Yet nurses may be inadequately trained in the use of coercive interventions (Janelli et al. 2006, Suen et al. 2006). Nurses attribute patients' aggressive behaviour to internal and external issues such as poor interaction between nurse and patient, patient's illness, and reactive response by patients and nurses to aggressive situations (Duxbury 2002). Nurses in the mental health field require specific knowledge, skills and personal qualities (Pryjmachuk 2011). Mental health clients, service users, appreciate mental health nurses who have good clinical and professional skills but who are also compassionate, empathetic and who have respect for the service user (Bee et al. 2008). Hence nurses working in the field of mental health suffer from stress, exhaustion and burnout (Prossner et al. 1996) because their working environment can be demanding as many nurses face violence at work (Farrell & Cubit 2005). This may lead to turnover and a shortage of competent nurses working in the field of mental health (Browne et al. 2013). In Finland, nurses' task is to promote people's health and prevent disease. They are also responsible for patients' care and rehabilitation. For example nurses plan and implement nursing care holistically. Moreover, they are responsible for medication. Nurses work both independently and in multi-professional teams. (Finnish Nurses' Association 2013.)

The field of mental health care needs competent, knowledgeable nurses (Torstad and Bjork 2007, Wright et al. 2011). However, many countries are facing a severe shortage of mental health nurses in health care organizations (WHO 2007, OECD 2012). In the field of mental health especially the upcoming shortage of nurses will be a serious problem (WHO 2007). It has been estimated that there will be a need for one million health care workers before 2020 (Sermeus & Bruyneel 2010, OECD 2012). In addition, nurses report high burnout rates, job dissatisfaction and intention to leave from nursing profession

(Aiken et al. 2012). Moreover, the nursing turnover is one challenge burdening health care organisations (Zhao et al. 2013). These concerns have caused countries to focus on nursing education and to offer nurses in-service training (OECD 2012). There are several reasons for nurses leaving the health care field, among them leadership, stress and pay (Coomber & Barriball 2007). A lack of adequate continuing education is one further reason contributing to nurses leaving the profession (Choi et al. 2012). More attention should be paid to nurses' adequate continuing education (Kontio et al. 2011). Therefore this study concentrates on nurses' continuing education in psychiatric hospital settings.

2.2 The system of nursing education

2.2.1 Nursing degree education

In Finland nurses' education is divided into four different phases; polytechnic nursing degree, university bachelor and master's degree, university doctoral degree, and continuing education. There are two options for taking the basic nursing qualification (Ministry of Education 2013). First, a person may undertake and complete upper secondary education at school lasting three years. Thereafter application can be made to a polytechnic, otherwise known as universities of applied sciences, for a bachelor's degree in nursing (3,5 years). Second, alternately a person may apply straight after basic education to take vocational qualifications in vocational institutions or undertake practical nursing education lasting three years. After this, such a person may apply to continue to a bachelor's degree in nursing in a polytechnic. (Ministry of Education and Culture 2013.) According to the Official Statistics of Finland (2013), the number of new students in polytechnic education leading to a qualification decreased by two per cent compared with the previous year. However, an increase was seen in the numbers of new students in the field of health and social sciences leading, for example to the qualification of bachelor of nursing (Official Statistics of Finland2013).

Nurses' educational system is similar in all Scandinavian countries and the variation is slight (Råholm et al. 2010). Moreover, nurses' education in all European countries is fairly similar however, some differences are also present in the education systems and titles offered (Lahtinen et al. 2013). This is partly due to the Bologna process at European level aiming to harmonise education systems in Europe (Davies 2008). In Finland, registered nurses' bachelor degree education is provided at polytechnic level. They provide higher education and practical professional skills and education includes on-the-job learning in clinical practice. Degree studies are 210 ECTS points and the length of studies are 3.5 years of full-time study. (Ministry of Education 2006.) EU Directives (2005/36/EY) and (2013/55/EU), requires registered nurses' education to include 90 ECTS points for clinical practice. Moreover, In Finland, education consist 15

ECTS for clinical practice in classroom situation (Ministry of Education 2006, European Commission 2007). In Finland, practical nurses' education is lower level education and the qualification in social and health care is a "Practical Nurse" entails 120 ECTS points, of which 29 ECTS points in practical training. Students can choose to specialize to the extent of 40 ECTS points and mental health care is among the options (European Commission 2007).

In addition, the registered nurses' curriculum in Finland varies slightly from polytechnic to polytechnic as regards mental health nurses' education although the competence requirements are the same (Ellilä et al. 2009). Studies in mental health care are generally included at the level of professional studies in polytechnics and take the form of theoretical studies and practical training (European Commission 2007). Around the world mental health education includes at least some components of assessment, treatment, rehabilitation, prevention and promotion, ethical and legal issues, research on mental health (WHO 2007).

In Finland, nurses' degree education has changed in over the decades. In the late 1950s nurses' degree education was changed from three years to 2.5 years of basic education and specialisation to some area was separated to own education lasting for one year. Altogether nurses' education took 3.5 years. In the 1980s a reform in school education again caused changes in nursing education, which once again came to last 3.5 years for basic nursing education. (Kujala et al. 2014.) The registered nurses currently working in Finnish hospitals come from these different educational backgrounds. Moreover, in our psychiatric hospitals there are still working mental health nurses with the older lower level education which no longer exists, even though such people are still employed in our psychiatric hospitals (Valvira 2014).

2.2.2 Nurses master and doctoral level education

After completing the degree required of a registered nurse a person can apply to university for bachelor's and master's studies and then to take a doctoral degree. In Finland there are five universities offering bachelor's, master's and, doctoral degrees in nursing science; the University of Eastern Finland, Kuopio campus, the University of Oulu, the University of Tampere, the University of Turku and Åbo Akademi University, Vaasa campus (Välimäki et al. 2008, Ministry of Education 2013). All these universities are responsible for the nursing science doctoral education together by running Finnish doctoral education network in nursing science (Välimäki et al. 2008).

Master's level education in university is completed in two parts. First, students take a bachelor's degree in nursing science carrying 180 ECTS. However; up to 100 ECTS may be accredited from earlier polytechnic nursing degree studies. Thereafter, the nursing science bachelor's degree takes 1-1.5 years to complete. Second, students take a master's degree

in nursing science carrying 120 ECTS and taking approximately two years. (University of Turku, Department of Nursing Science, 2014.) In nursing science doctoral students are required to complete 60 ECTS in theoretical studies and their goal is to become innovative and scientifically competent researchers (Hupli & Leino-Kilpi 2006).

Nursing bachelor's and master's education has been undergoing reform in recent decades (Spitzer & Perrenoud 2006, Löfmark & Mamhidir 2010, Råholm et al. 2010). This is due to the Bologna Declaration, which aims to organize the future education in Europe based on frameworks of bachelor's, master's and doctoral degrees (Jackson et al. 2009). Lahtinen et al. (2013) looked closely at 45 European countries and their nursing education and showed that 60% of these countries offered master's and doctoral degrees in nursing.

2.2.3 Nurses continuing education

After completing basic nursing degree education there is a different kind of continuing education available to update existing knowledge (Ministry of Education 2013). In the literature several terms are used to refer to continuing education, such as continuing medical education, continuing professional education, continuing professional development and lifelong learning. Continuing education necessitates a good economic situation and opportunity to participate and the attributes of continuing education are goals, professional dimension and focus on clinical practice. Moreover, continuing education should produce better clinical practice, and professional growth and development. (Gallagher 2007.)

Employers have the responsibility to organise continuing education for health care professionals (Ministry of Social Affairs and Health 2004, Ministry of Social Affairs and Health 2013). However, it is typically employees in the health care field who obtain continuing education on their own initiative (Ministry of Social Affairs and Health 2004). Nevertheless, employers have a key role to support and determine the continuing education needs and facilitate the continuing education for employees (Aarnio 2005). The municipalities are likewise charged by law with the responsibility to organise continuing education. The Council of State has issued a decision-in-principle that health care professionals should have from three to 10 days of continuing education per year. The number of continuing education days differs depending on educational level, work requirements and job description. (Ministry of Social Affairs and Health 2004.) The Official Statistics of Finland (2013) show that half of the employees did indeed take continuing education related to their work in 2012 and most of this continuing education was offered by the employer. However, the numbers of days spent in continuing education has decreased from six to five in Finland, among all employees (Official Statistics of Finland 2013). Moreover, in Finland the trend in continuing education seems to go more for distance learning and e-learning increased 6% in 2010 (Official Statistics of Finland 2012).

Continuing education among health care professionals is regulated by law (Act on Health Care Professionals 559/1994) and by the statute on continuing education (Finnish Statute of Continuing Vocational Education 1194/2003). Moreover, other laws also affect nurses' continuing education; The Health Care Act 1326/2010 (Finlex), and the Occupational Health Care Act 1383/2001 (Finlex). Moreover, new legislation makes it possible for health care professionals who wish to have right to prescribe medication to obtain such rights (Finnish Statue on the education needed to prescribe medication 1089/2010). (See Table 1.) The Ministry of Social Affairs and Health (2004) has also published a recommendation for the further education for health care personnel. This comprises four main recommendations; 1) Planning of further education, 2) Making further education possible and its realisation, 3) Monitoring of further education, and 4) Evaluation criteria for further education. Continuing education is seen as systematic, tailored, short or long term education aiming to maintain and improve health care professionals' competence. (Ministry of Social Affairs and Health 2004.)

Table 1. Legislation regulating continuing education.

Laws and Statutes governing continuing education	**Purpose of continuing education**
Act on Health Care Professionals 559/1994	• Health care professionals have an obligation to take part in continuing education. • They must maintain and improve their professional knowledge and skills. • They must also familiarise themselves with the provisions and regulations concerning them.
Finnish Statute on Continuing Vocational Education 1194/2003	• Health care professionals need to maintain their professional competence and thereby support health care organisations' work. • Continuing education should be planned to meet the needs of the organisation and teaching methods should be planned to meet the needs of the participants. • Health care organisations should follow how continuing education is obtained.
Health Care Act 1326/2010	• Local authorities and joint municipal authorities for hospital districts should ensure that health care personnel undertake adequate continuing education. • The continuing education should reflect the length of the basic training of the personnel, the demands of the job and the tasks involved.
Occupational Health Care Act 1383/2001	• Employers of occupational health care professionals have an obligation to ensure that employees attend continuing education to maintain their professional competence. • It is recommended that continuing education is sufficiently often and no less than once every three years.
Finnish Statue on education needed to prescribe medication 1089/2010	• To have a right to prescribe medication health care professionals (nurse, public health nurse, midwife), need to take continuing education amounting to 45 ECTS in higher education studies.

The purpose of continuing education is to promote the development of knowledge and skills to improve professional competence (Nalle et al. 2010). The Ministry of Social Affairs and Health (2006) has paid attention to the quality of mental health education and stated that education needs to change to respond to the challenge of WHO (2005), which has stated that nurses' professional competence development is seen as a significant challenge in mental health nursing (WHO 2005). It is important that nurses in the mental health care field can combine their existing knowledge and skills with new information received with continuing education (Bell et al. 2007). Competent nurses have the capacity to integrate knowledge, skills, attitudes and values in specific practical nursing situations (Epstein & Hundert 2002). The national plan for mental health and substance abuse work defines the core principles and priorities for the future of mental health and substance abuse work until 2015. The core principles include multi-professional continuing education among mental health and substance abuse workers. (Ministry of Social Affairs and Health 2009.) Psychiatric patients are vulnerable and their self-determination may be violated in hospitals by coercive measures such as seclusion and restraint (WHO 2005). Therefore nurses should have special competencies to work in this ethically sensitive nursing area (Välimäki et al. 2008). However, even qualified nurses sometimes fail to recognise the ethical implications of restrictive measures or their meaning to a patient (Marangos-Frost & Wells 2000). Therefore, attention should paid to nurses' continuing education.

Benefits and barriers have been reported regarding continuing education. The benefits reported have included motivation to learn (Jouce and Koffman 2007), commitment to the organisation (Gould and Fontenla 2006), increase of knowledge (Cook et al. 2008), better communication (Wright et al.2011) and improved health care practice (Forsetlund et al. 2009). Organisations benefit from continuing education as means to achieve better patient outcomes such as coping with patients' symptoms (Covell 2009). Moreover, when educating the whole team more through education knowledge of evidence based practices can be transferred to clinical practice (Cleary et al. 2009). Barriers to participating in continuing education are difficulties in travelling, financial issues, inadequate time for continuing education and also lack of support to participate in continuing education (Robinson & Tingle 2003, Pentz et al. 2007, Cleary et al. 2013). In Finland, too, health care organisations have reported the same kind of hindering factors such as lack of resources and finances, difficulties to organize working schedules, and lack of adequate continuing education courses (Aarnio 2005). Nevertheless, nurses have reported some suggestions to overcome these barriers, such as changes at system and cultural level, decreasing workload and hours, having opportunities and or places in continuing education, broadening clinical expertise and changes in the managerial system (Cleary et al. 2013). There is only little evidence about possible disadvantages from continuing education, such as costs (Björk et al. 2009) and time used for education

(Steensma and Groeneveld 2010). On the other hand, the organisation may benefit eventually through cost savings as nurses are retained at work and are more satisfied (Covell 2009). Continuing education may be challenging for those with poor time management skills but it may still ultimately offer more advantages (Cleary et al. 2009).

Effective continuing education focuses on health care professionals' educational needs and improves their' professional competence, well-being, job satisfaction and commitment to work (Docherty et al. 2005, Gilbody et al. 2006, Nolan & Bradley 2007). Findings from a meta-analysis of medical continuing education (Mansouri & Lockyer 2007) suggest that continuing education is effective in terms of increasing knowledge. In addition, they show that a single group of participants (e.g. one discipline together) helps to raise the knowledge level and this may be because it is then possible to offer more focused material. Increasing the length of the course may also affect to knowledge level. (Mansouri & Lockyer 2007.) However, there are a number of concerns about the effectiveness of continuing education in health care services (Robertson et al. 2003, Pilcher 2014). First, continuing education has rarely been integrated into the organisation's strategic plan. Second, individual needs have been insufficiently taken into account. (Finnish Ministry of Social Affairs and Health 2004.) Third, the learning methods used may be not taken into consideration, as a systematic review by Forsetlund et al. (2009) showed that education sessions alone cannot change the practice. However when combined with interactive workshops results the showed moderately large changes in the practice. Fourth, a shortage of qualified health care personnel or inadequate financing can prevent the staff from participating in education (Pentz et al. 2007). Fifth, concern has also been raised as to how outcomes are measured in continuing education (Pilcher 2014). Therefore, this study is concerned with nurses' systematic continuing education in psychiatric hospitals.

2.3 e-Learning in nurses' continuing education

In nursing various teaching methods have been used in continuing education. The most common form of face-to-face teaching is lecturing in the classroom situation (Di Leonardi 2007). Benefits have been reported in the literature of using lecture as teaching method as, for example, an easy way of summarising information, providing students with an expert perspective and offering them a shared learning experience between teacher and student (Lom 2012). Moreover, lecturing can also be interactive through including questions (Choi et al. 2012) or creating an interesting and energising atmosphere in the classroom situation (Amerson 2006). Nevertheless, there has been concern that students may not remember the things addressed during the lectures (Pilcher 2014). Blended learning means using information and communication technology (ICT) together with face-to-face teaching (Edginton & Holbrook 2010, Glogowskaet al. 2011, López-Pérez et al.

2011, Smyth et al. 2012). Blended learning is widely used in nursing education (López-Pérez et al. 2011, Smyth et al. 2012). There are some benefits of blended learning such as integrating well-functioning e-learning forms with good face-to-face contact (Edginton & Holbrook 2010). Moreover, flexibility, satisfaction and opportunity to control the time and place of studies have been mentioned as benefits of blended learning (Edginton & Holbrook 2010, Glogowska et al. 2011). However, some disadvantages have been reported including feeling of isolation, feeling that not all topics are suitable for delivery online and the time elapsing between face-to-face sessions may be too long (Glogowska et al. 2011). Therefore the focus needs to be on learning formats conducive to an active way of learning for adult learners ensuring a memorable learning process (Pilcher 2014).

E-learning is widely used in nurses' continuing education (Maxwell & Mucklow 2012). In the United States from 2007 to 2008, approximately 4.3 million undergraduates i.e 20% of all undergraduates, took at least one e-learning education course (U.S. Department of Education 2011). This shows 16% growth in choosing e-learning courses in less than ten years (Radford & Weko 2011). E-learning is an innovative, dynamic and substantial way to offer learning opportunities (Belcher & Vonderhaar 2005). It is challenging to find a universal definition for all e-learning using information and communication technologies in learning and teaching and therefore e-learning is a generic term and has been defined in several ways (Sajeva 2006, Maxwell & Mucklow 2012). Most commonly e-learning refers broadly to different kinds of learning and teaching using electronic devices and internet opportunities (Maxwell & Mucklow 2012). It has been stated that students need to spend at least 25% online in one course for this to count as e-learning (Sajeva 2006). The term e-learning has several synonyms, such as web-based learning, online learning, digital learning, distributed learning, computer-assisted learning, or internet-based learning. However its commonly stated that e-learning subsumes all these different forms of education (Ruiz et al. 2006, Ruiz et al. 2007, Sajeva 2009). Hence, several terms for e-learning are used; e-learning is a cognitive tool for learning enabling a variety of teaching-learning approaches (Kala et al. 2010).

E-learning is a suitable method for adult learners such as health care professionals' continuing education courses. Self-directed learning styles are commonly used among e-learning to guide students to active learning (Korhonen 2003, Cook & Dupras 2004, Lau & Bates 2004, Pilcher 2014). This enables students to construct their knowledge and be active in their learning process (Korhonen 2003, Wolbrink & Burns 2012, Pilcher 2014, Goh & Clapman 2014). Students' own activity in the learning process is deemed important in e-learning and it may be encouraged through self-assessment, reflection, problem-based learning and feedback from a tutor or teacher (Cook & Dupras 2004). Moreover, interaction with other students is used and communication with a tutor or teacher (Lau & Bates 2004). e-Learning can be divided into passive, facilitated learning, interactive learning and virtual reality (Maxwell & Mucklow 2012). Passive teaching is

its simplest form mainly just delivering learning material in the form of text or pictures (Maxwell & Mucklow 2012). Facilitated learning involves no interaction but rather well organised opportunities to locate learning material and other resources like web-links (Maxwell & Mucklow 2012, Leung et al. 2013). Interactive learning provides more interaction and can be partially simulated in reality but also offers some feedback based on student input. Moreover, students can be in contact with a teacher using interactive tools. (Ruiz et al. 2006, Maxwell & Mucklow 2012.) Kim & Bonk (2006) found that the most used pedagogical techniques to deliver e-learning are group problem-based learning and collaborative tasks, problem-based learning, discussion, case-working, student generated content, simulations, mentoring, guided learning, lecturing and modelling the solutions. Korhonen (2003) showed that adult learners in the health care field found three different tasks related to learning while using e-learning; personal tasks, collaborative tasks and organized tasks.

E-learning can be implemented in many ways (Maxwell & Mucklow 2012) and can be realised synchronously and asynchronously (Ruiz et al. 2006). A synchronous method means that teaching is delivered in real-time, where students receive information simultaneously and can communicate directly with other students (Ruiz et al. 2006, Cook et al. 2008). In other words, asynchronous methods refer to teaching and learning non-simultaneously (Ruiz et al. 2006). There are different ways of delivering synchronous teaching and learning, for example, teleconferencing, online chat and instant messaging (Ruiz et al. 2006, Cook et al. 2008). On the other hand, asynchronous teaching and learning can be achieved by students self-learning and taking responsibility to read and obtain information through the e-learning platform (Ruiz et al. 2006). Materials may be provided asynchronously so that students access the website of their e-learning course and hear lectures or complete assignments according to their own timetable (Simpson 2003). In addition, different feedback methods can be used such as e-mailing or using feedback technologies systems (Ruiz et al. 2006). E-learning may use different e-learning platforms and it is important that no matter what platform is used, that there are opportunities to create solid technological infrastructure (Sajeva 2006). E-learning uses diverse properties to deliver its content (Kim & Bonk 2006). E-learning courses use mostly written text, multimedia such as audio and video, links to other online sources, online discussions, e-mail discussion, power points, live chat and virtual patient (Cook et al. 2010). Moreover, several instructional methods are used such as online lecture, online discussion, exercises, self-assessment, homework and assignments (Cook et al. 2010). And, lastly, virtual reality refers to high fidelity three-dimensional simulation using, for example, virtual patient cases (Cook & Triola 2009, Park et al. 2009, Maxwell & Mucklow 2012).

There are numerous benefits from using e-learning (Ruiz et al. 2006, Cook et al. 2008, Maxwell & Mucklow 2012). Cost savings have been reported while using e-learning

compared to conventional methods to deliver education (Maxwell & Mucklow 2012). Cost savings may even reach 50% compared to teacher-led courses. Savings come from teachers' time, students' travel costs, and by reducing the use of institutional infrastructure (Ruiz et al. 2006). However, a cost savings study predicts that facilities providing e-learning have the needed equipment already (Chumley-Jones 2002). Economic benefits and time savings from e-learning are essential benefits still (Bartley & Golek 2005). Other benefits are reportedly students' flexibility in the choice of the time and place to pursue the studies (Schittek et al. 2001, Curran et al. 2010, Leung et al. 2013, Goh & Clapman 2014). E-learning can increase students' feeling of being in control over their studies (Cook et al. 2010, Goh & Clapman 2014) and emphasise learners' self-efficacy (Docherty et al. 2005). Furthermore, e-learning can help students' knowledge and skills to improve faster than traditional instructor-led methods (Cook et al. 2008). In addition, practice exercises, repetition, interactivity and feedback improve learning outcomes (Cook, et al. 2010). Using e-learning it has been shown to enable students to transfer knowledge to practice (Wutoh et al. 2004). From a teacher's point of view the advantages of e-learning are the opportunity to provide education to a large group of students at the same time, the opportunity to monitor students' working and assess the learning outcomes more easily. It is moreover faster the update the information in e-learning and deliver the content to the students (Maxwell & Mucklow 2012). The literature also mentions critical success factors of e-learning such as organisational commitment to delivering the course, teacher/tutor motivation and supportive attitude, but also students' positive attitudes toward e-learning (Ruggeri et al. 2013).

Some disadvantages have been reported from using e-learning, mostly the loss of human contact (Maxwell & Mucklow 2012), lack of student's time and resources (Bell & MacDougall 2013), and the requirement for good student motivation and time management (Maxwell & Mucklow 2012). Even though nurses' attitudes towards e-learning are becoming more positive, their computer skills still impede their proper use of internet sources (Wilkinson et al. 2009). However, nurses tend to use computers and internet daily in their work (Koivunen et al. 2014). Therefore technical problems such as loss of internet connection, inadequate software, or even a computer virus may create frustration when using e-learning (Wolbrink & Burns 2012). Moreover, management and organisation need to support the use of e-learning so that it can be achieved properly (Kontio et al. 2011). Childs et al. (2005) describe the barriers to using e-learning as issues related to the organisation and development of e-learning courses. Moreover, they point out the economic barriers related to the costs of hardware and program licences, but a lack of technical support in the organisation may also delay the use of e-learning. In addition, it was discovered that managers had problems with pedagogical issues related to e-learning quality, motivation of students, and resistance to using e-learning among students. (Childs et al. 2005.)

The evaluation of e-learning education is important. Despite the huge number of e-learning courses available, only few studies have evaluated e-learning education. (Horne & Sandmann 2012.) Moreover, a good quality system for assessing e-learning courses is advisable (Little 2009). Evaluation must be tailored to fit the program under evaluation (Rossi & Freeman1993, Kirkpatrick & Kirkpatrick 2006) and furthermore is a process of obtaining and presenting information related what and how the students are learning (Farrus & Costa-jussa 2013). The purpose of e-learning evaluation is to find out what is effective and what not (Karaman et al. 2013) and this can be obtained from the process, content, outcome and impact of the education (Bell et al. 2007). Systematic evaluation of e-learning courses needs either a theoretical model or an evaluation approach (Horne & Sandmann 2012, Karaman et al. 2013). Systematic evaluation includes assessment of activities, characteristics and program outcomes (Horne & Sandmann 2012). Therefore this study concentrates on evaluating one e-learning course offered to nurses working in psychiatric hospitals.

2.4 Theory of Kirkpatrick's evaluation model

2.4.1 Description of Kirkpatrick's evaluation model

Kirkpatrick's evaluation model was developed in 1959 and published in the Training and Development Journal as a series of four articles entitled a "Technique for Evaluating Training Programs" (Kirkpatrick 1996, Kirkpatrick & Kirkpatrick 2006). Donald Kirkpatrick decided after a training programme to study students' reaction as satisfaction with the programme, measuring students' learning after training by assessing to what extent students were able to change their behaviour after the training programme when they returned to their original workplaces and lastly, measuring any final result achieved (Kirkpatrick 1996). Kirkpatrick's purpose was to clarify the term evaluation and to determine what it made sense to evaluate (because so many evaluated either what change has occurred or satisfaction) (Kirkpatrick & Kirkpatrick 2006). The idea was to create an easy-to-use evaluation model to assess learning outcomes (Kirkpatrick 1996, Kirkpatrick &Kirkpatrick 2006). Kirkpatrick's evaluation model has been extensively used and with slight modifications over the decades (McNamara et al. 2010, Hamtini 2008), for example, to suit e-learning courses (Hamtini 2008).

Kirkpatrick's model includes four levels, originally called steps: reaction, learning, behaviour and results (Kirkpatrick 1996, Kirkpatrick & Kirkpatrick 2006). First, reaction is described as how well students like a training programme meaning satisfaction, and moreover students' impressions and how students feel about the training programme (Kirkpatrick 1996). The meaning of reaction has stayed the same over the years in Kirkpatrick's model (Kirkpatrick & Kirkpatrick 2006, Hamtini 2008). The point in

measuring reaction is to see how students react towards an educational programme because it is important that students are favourably disposed to the programme if they are to learn from it. With Kirkpatrick's model, when measuring reactions, one must decide what is to be ascertained and how this is to be measured. Honest responses and as wide as possible a range of different reaction measurements should be sought, such as written suggestions, and comments, surveys and measurement tools. (Kirkpatrick & Kirkpatrick 2006.)

Second, learning is described in its simplest form by what principles, facts and techniques students understood from the programme (Kirkpatrick 1996). However, later in the model the term learning was extended to cover knowledge, skills and attitudes (Kirkpatrick & Kirkpatrick 2006, Hamtini 2008). This can be achieved by measuring what knowledge was learned, what skills were improved and what attitudes were changed. It is important to measure the level of learning because no change in behaviour can occur unless some of these knowledge, skills or attitudes have been obtained from the programme. There are several ways to measure learning and Kirkpatrick recommends using intervention and control group and evaluating knowledge, skills and attitudes before and after the programme. By measuring learning the teacher can see the effectiveness of the programme. (Kirkpatrick & Kirkpatrick 2006.)

Third, behaviour can be understood as the difference in how much someone knows and at what level he can act on that basis. In other words, there is a difference between knowing all the facts and techniques and being able to use them at work. (Kirkpatrick 1996.) Behaviour can also be defined as how much knowledge transfer occurs and how much students are able to use their newly learned knowledge or skills in the workplace (Kirkpatrick & Kirkpatrick 2006, Hamtini 2008). First of all, students have to have the opportunity to change their behaviour, and it is still unclear when they will change their behaviour. It is suggested to allow some time to pass before conducting the behaviour evaluation and also to repeat the evaluation at an appropriate point in time. (Kirkpatrick & Kirkpatrick 2006.) It may be possible to appraise the behaviour before and after the training and/or to have post training evaluation at 3 months or even later (McNamara et al. 2010). Kirkpatrick recommended different measurements such as surveys and interviews. (Kirkpatrick & Kirkpatrick 2006.)

Lastly, results are most important and try to find out those desired outcomes of educational training from the organisations' perspective (Kirkpatrick 1996). These may, for example, be cost reduction and increased productivity. However, it is the final results which evaluator wants to evaluate as result of training. At this level, it is good to see what initial aims and goals were set for the training programme and how these were achieved. Therefore it is for the evaluator to decide what those final desired results are. Moreover, while evaluating the final results, an evaluator needs to allow time for the results to be

take shape. The challenge is to determine how long to wait before obtaining level four evaluation as it lags behind behaviour change. (Kirkpatrick & Kirkpatrick 2006.)

Kirkpatrick's model has been widely tested in several research contexts over the decades (Alliger & Janak 1989, Kirkpatrick 1996, Galloway 2005, Sears et al. 2008, Smidt et al. 2009, Praslova 2010, Yardley & Dornan 2011). Its popularity is based on several factors (Bates 2004). First of all, it is simple to use (Alliger & Janak 1989, Bates 2004), it has been shown to be flexible (Galloway 2005), it offers a systematic taxonomy for evaluation training outcomes (Alliger & Janak 1989, Bates 2004), and valuable information from an organisational perspective (Bates 2004). Moreover, Kirkpatrick's model has raised the awareness to take a more detailed organisational perspective on what education can do and how it can serve the organisation (Bates 2004). Kirkpatrick's model is usable to evaluate training implications at organizational level (Smidt 2009) and has made a great contribution to systematic training evaluation (Bates 2004, Galloway 2005).

However, some criticism of the model has been expressed. Allinger & Janak (1989) stated three assumptions based on the model. First, that each properly obtained level is more informative than the last one and therefore all levels of evaluation should obtain. Second, each level is a caused by the previous level. And lastly, all correlations among levels are positive. (Alliger & Janak 1989.) To see more precisely what Allinger and Janak (1989) intended necessitates a closer look at the assumptions. The first assumption starts with the idea that all levels are present in every education programme. However, there may be situations in which not all the education is targeted at behavioural change or cost savings (Allinger & Janak 1989). Moreover, in the second assumption criticism is levelled at the causality (Allinger & Janak 1989, Bates 2004) that positive reactions lead to greater learning and so to students' greater knowledge transfer to practice, therefore achieving more positive organisational results (Bates 2004). Lastly, that all levels correlates positively are in line with second assumption that model is causal. However, Kirkpatrick (1996, 2006) was rather vague about the causality between the levels. Therefore Allinger et al. (1997) made a meta-analysis of the correlations between the four levels and were able to show correlations between levels in a hierarchical way.

Despite this critique, Kirkpatrick's model offers a systematic evaluation model for e-learning courses to explore health care professionals' reactions, learning, behavioural change and impacts as results of education. There is a number of reasons why Kirkpatrick's evaluation model was chosen to this study. First, Kirkpatrick's evaluation model is widely used within different disciplines (Alliger & Janak 1989, Kirkpatrick 1996, Galloway 2005, Sears et al. 2008, Smidt et al. 2009, Praslova 2010, Yardley & Dornan 2011). Second, it is a suitable evaluation model for adult learners in the health care field (Roos et al. 2014). Third, it has also been tested for e-learning (Hamtini 2008). Fourth, it enables both formative and summative evaluation (McNamara 2010). Fifth,

even though there are other learning evaluation models, for example, Brinkerhoff's evaluation model (Holton & Kirkpatrick 1996), which is modified from Kirkpatrick's model, Kirkpatrick's evaluation model gives the needed insight, for example, from the organisation's perspective, for this study. Therefore Kirkpatrick's evaluation model was used as a theoretical approach in this study. Later in this doctoral dissertation, in Chapter Four the use made of this model is presented in more detail.

2.4.2 Earlier research findings related to reactions to e-learning

Reaction to e-learning has been studied in many literature reviews, most often in terms of satisfaction (Cobb 2004, Curran & Fleet 2005, Cook et al. 2008, 2010). It has been shown that e-learning is increasing among health care professionals and their satisfaction with different kinds of e-learning methods is good (Cobb 2004). Health care professionals have been satisfied with using e-learning in continuing education and moreover the use of e-learning is ideal, flexible and interactive (Curran & Fleet 2005). However, Cook et al. (2008) in their meta-analysis compared e-learning to a non-internet based format continuing education and found that health care professionals favoured the e-learning even though the findings were not statistically significant. In addition, they found statistically significant results in their subgroup analysis showing that health care professionals favoured short courses, high-quality studies and single courses instead of ongoing ones (Cook et al. 2008). Moreover, Cook et al. (2010) scrutinised health care professionals' satisfaction towards different instructional designs in e-learning in greater detail and found that they preferred more online discussions, interactivity, practice exercises, audio and audio in discussions.

Reactions to e-learning have also generally been described in many single studies in the field of health care in terms of satisfaction as satisfactory (Maag 2004, Smith 2005, Curran et al. 2006, Connolly et al. 2007, Gilbert et al. 2007, Curran et al. 2010). But a few studies have also measured reactions in terms of health care professionals' willingness to recommend e-learning courses to others (Wallner et al. 2007, Wehrs et al. 2007, Connolly et al. 2007). Instant reactions or impressions of the course have not been so often described, but Sears et al. (2008) illustrated health care professionals' instant reaction to e-learning and showed that health care professionals were satisfied with an e-learning course covering the needed information, and that they liked the interactivity. Moreover, MacDonald & Walton (2007) showed that e-learning education can affect turnover among health care professionals. In their study, a downward trend of as much as 20% in employee turnover was seen from the year preceding the implementation of the e-learning programme to the year during which the e-learning programme was implemented (MacDonald & Walton 2007). Satisfaction with e-learning among nurses showed that nurses were more satisfied with e-learning than with traditional methods (Maag 2004, Smith 2005, Connolly et al. 2007). On the other hand, Gilbert et al. (2007)

elicited nurses' experiences of e-learning. The reasons for their expressed satisfaction were better synergy between theory and practice, and that e-learning enhanced their understanding of the course themes, and they appreciated the interaction in e-learning course. Curran et al. (2010) compared two different formats for delivering e-learning. They compared a scheduled e-learning course to a non-scheduled one and found that health care professionals were more satisfied with the scheduled e-learning course. However, both groups were still really satisfied with e-learning. (Curran et al. 2010.) In addition, health care teachers are satisfied with using e-learning even though it may initially take more time than conventional teaching (Connolly et al. 2007).

Reaction as regards willingness to recommend an e-learning course to others has been also studied. Wallner et al. (2007) asked health care professionals after an e-learning continuing education course if they would recommend it to other nurses. It emerged that 96% reported that they would recommend e-learning to others (Wallner et al. 2007). In addition, Wehrs et al. (2007) also asked after an e-learning course if the participating nurses would recommend it to others and 100% of the participating nurses said that they would recommend e-learning to others. Moreover, Connolly et al. (2007) reported similar finding that those who are satisfied with e-learning method would recommend it to others.

2.4.3 Earlier research findings related to learning from e-learning course

Learning has been described as increase of knowledge, skills or change in attitudes in many literature reviews of e-learning (Shittek et al. 2001, Chumley-Jones et al. 2002, Cobb 2004, Wutoh et al. 2004, Lewis et al. 2005, Curran & Fleet 2005, Cook et al. 2008, 2010, Feng et al. 2013). e-Learning continuing education has improved health care professionals' knowledge, skills and attitudes (Wutoh et al. 2004) and e-learning education has been shown to be an effective method in terms of increasing knowledge (Cobb 2004, Feng et al. 2013). A similar trend has been reported in general in health care professionals' education using e-learning where e-learning has enhanced knowledge, but when compared to different control groups the effects are equal (Cook et al. 2008, Feng et al. 2013). e-Learning can be as good as other format of continuing education or as effective but not superior to traditional continuing education (Cobb 2004, Wutoh et al. 2004). In addition, Cook et al. (2010) in their meta-analysis scrutinised instructional design variation and its relation to learning outcomes and showed that altogether interactivity, practice exercises, repetition and feedback improved health care professionals learning outcomes when using e-learning.

It has been shown that e-learning alone can improve the level of knowledge among health care professionals (Shittek et al. 2001, Chumley-Jones et al. 2002, Lewis et

al. 2005, Curran & Fleet 2005, Cook et al. 2008, Feng et al. 2013). However, when comparing e-learning to other methods no statistically significant difference was found (Chumley-Jones et al. 2002) or the effect was smaller (Feng et al. 2013). Cook et al. (2008) in their meta-analysis showed that when comparing e-learning with no intervention it seems to produce higher knowledge level however, there were large inconsistency with studied. Nevertheless, when comparing e-learning to a non internet intervention, the difference between knowledge levels was smaller but yielded statistical significantly better results in longer e-learning courses (Cook et al. 2008, Feng et al. 2013). Moreover, when looking at skills compared e-learning with no intervention results showed significant improvement in skills but while looking at skills compared e-learning to no internet intervention results were no longer so significant. However, in the subgroup analysis there emerged statistically significant results showing better outcome in skills when there is more interactivity, practices and peer discussions. (Cook et al. 2008.)

Learning from e-learning course has also been described also in many single studies in the field of health care. Learning has mostly been described as an increase of knowledge (Maag 2004, Davis et al. 2005, Huckstadt & Hayes 2005, Curran et al. 2006, Wehrs et al. 2006, Wallner et al. 2007, Durkin et al. 2008, Sears et al. 2008, Lu et al. 2009). e-Learning can increase health care professionals' knowledge (Davis et al. 2005, Huckstadt & Hayes 2005, Curran et al. 2006, Wehrs et al. 2006, Wallner et al. 2007, Sears et al. 2008). However, Maag (2004) showed that when comparing four different groups (text, text and image, multimedia, e-learning) in terms of improvement in knowledge, all groups scored higher on knowledge but no difference was found between groups. In addition, Durkin (2008) studied nurses' learning on an e-learning course in terms of knowledge. They had two groups, one interactive and the other text-based. The results showed that the nurses in both groups scored statistically significantly higher on knowledge after the education. Moreover, the e-learning group scored statistically significantly higher in the second post test. (Durkin 2008.) Lu et al. (2009) studied nurses' learning in terms of knowledge and skills when using e-learning and with a control group, and the nurses scored statistically significantly higher score in the knowledge test but no statistically significant difference was found between the groups. Moreover, when they performed a skills test after the educational programme, the e-learning group scored statistically significantly higher on skills. (Lu et al. 2009.) Curran et al. (2010) compared two different e-learning formats in terms of health care professionals' learning as knowledge. They showed that the scheduled e-learning yielded better learning outcomes than the non-scheduled e-learning. (Curran et al. 2010.) Learning as change in attitudes has been studied less, but Kulier et al. (2009) showed that there were no statistical differences from the control group in health care professionals' attitude scores related to the content of e-learning after e-learning.

2.4.4 Earlier research findings related to behaviour change and impacts resulting from e-learning

There are far fewer literature reviews on e-learning and its effects on students' behaviour or knowledge transfer to their clinical practice. Behaviour is most commonly described as change in behaviour or actions after e-learning education (Wutoh et al. 2004, Curran & Fleet 2005, Cook et al. 2008) or knowledge transfer to clinical practice after participating in e-learning education (Lewis et al. 2005, Sears et al. 2008) or performance after the education (Alkhalaf et al. 2012, Feng et al. 2013). Wutoh et al. (2004) in their review showed that few studies reported change in students' behaviour after e-learning course. However, another study suggested that behaviour change in students' clinical practice was not stable, but relapsed as time passed by (Wutoh et al. 2004.) Curran & Fleet (2005) reported that among health care professionals there is behaviour change in terms of performance improving after an e-learning course. However, only two studies in their review had evaluated behaviour, but the outcomes were promising that health care professionals were able to change their behaviour in practice. Cook et al. (2008) investigated health care professionals' behaviour or actions in practice and patient care as results of behaviour. They found that nineteen studies out of 130 had behaviour as an outcome. The results favoured the use of e-learning, but there was much inconsistency between interventions. Moreover, they found six studies out of 76 comparing e-learning to a non-internet intervention where the outcome was behaviour. The results tended to favour e-learning but the inconsistency was even greater than when comparing to e-learning to no intervention. (Cook et al. 2008.)

Knowledge transfer to clinical practice among health care professionals is possible after an e-learning course (Lewis et al. 2005, Sears et al. 2008). Lewis et al. (2005) studied transfer of learning and only three studies out of 25 mentioned that there was some knowledge transfer to practice. Sears et al. (2008) asked health care professionals if they were able to transfer knowledge from an e-learning course to their clinical practice and nearly 60% reported that they were indeed able to transfer knowledge to practice. One other study showed that students were able to improve their performance after participating in an e-learning course (Alkhalaf et al. 2012). Gruson et al. (2013) also noted that e-learning has been shown to be effective in terms of knowledge transfer to daily practice. Feng et al. (2013) showed in their meta-analysis of e-learning that it can improve performance, especially with student nurses or medical students. Moreover, they highlighted that e-learning can improve novice learners' performance more although performance improved in all participant groups (Feng et al. 2013).

The final results desired from an e-learning course can be determined at the beginning of the course and be whatever the educators want to look as final results from education

(Kirkpatrick & Kirkpatrick 2006). Surprisingly, even though e-learning has shown several benefits related to time end flexibility research on the cost effectiveness of e-learning is still rare (Ruggeri et al. 2013, Chumley-Jones et al. 2002). On the other hand, in the literature Kirkpatrick's level four evaluation is commonly understood as the cost effectiveness of the education offered (Kirkpatrick 1996, Kirkpatrick & Kirkpatrick 2006, Hamtini 2008). Chumley-Jones et al. (2002) showed that one study out of 76 had cost-effectiveness as outcome and showed that there are cost savings in using e-learning. However, they did not calculate the cost of designing the education of the cost of hardware/software. Moreover, they assumed that the technology is available to students. (Chumley-Jones et al. 2002.) However, not much literature is available with patient outcome as the final result (Cook et al. 2008). Curran & Fleet (2005) found that out of 86 studies evaluating e-learning none had that level four evaluations as final results, would have obtained. Patient health outcome was evaluated in one review as a result but it was pooled together with behaviour so no direct conclusion was feasible (Cook et al. 2008). In other words, to be able to fully understand e-learning effects on health care professionals, the scope of evaluation should turn from satisfaction and knowledge level to a more profound understanding of e-learning effects as final results (Ruggeri et al. 2013). Results as the final outcome are also related to desired outcomes from education (Kirkpatrck & Kirkpatrick 2006). Therefore, different amendments from e-learning course should be seen from the participants' perspective but also from the perspectives of other stakeholders including the organisation (Ruggeri et al. 2013).

2.5 Description of the e-learning continuing education course

The e-Learning course used in this study (titled "ePsychNurse.Net") was originally developed on a European Union project in the period 2006-2009 involving six European countries; Finland, England, Ireland, Portugal, Italy and Lithuania. The aim of this project was to ensure high quality, ethically appropriate and therapeutically effective interventions to enable nurses to manage distressed and disturbed patients in psychiatric hospitals and inpatient units. The goal of this project was to develop an e-learning course for psychiatric nurses working in the field of mental health care. (Välimäki et al. 2008.)

The base for developing an e-learning continuing education course relied on an analysis of nursing education, legal and ethical codes and acts, healthcare systems, and patient restrictions in six European countries involved in this European level project (Välimäki et el. 2008). Moreover, before the development of the e-learning course nurses' and physicians' educational needs in the management of aggressive and disturbed patients and seclusion were studied at national level (Kontio et al. 2009, 2010). Determining

the needs of future participants is recommended to ensure that courses developed are effective and meet the needs of the participants (Kirkpatrick & Kirkpatrick 1996).

The theoretical underpinning of the e-learning continuing education course was reflective learning (Bulman & Schultz 2004). Reflection is often defined in such a way that a person reflects her/his thoughts and feelings in cognitive acts such as thinking, in order to make sense of them, and to make contextually appropriate changes if these are required (Taylor 2000). Reflective learning on this e-learning course means that reflection is a process of reviewing some critical incident occurring in practice in order to describe, analyse, evaluate one's work and learn from this (Taylor 2000, Bulman & Schultz 2004). Reflection is used in reflective writing exercises using Gibbs cycle (Paterson & Chapman 2013). In Gibbs cycle students think through one critical incident, what happened, how they felt in that situation, what judgement they can make on it, what was good and bad in that incident, what they would do differently if that incident were to happen again. The last phase is to make a plan if this incident were to happen again (Paterson & Chapman 2013). Students write this reflective assignment in every unit and they submit the reflective task and a tutor (experienced nurses with MNS and/or PhD degree) comment it.

E-learning course used in this study was called ePsychnurse.Net, later in this dissertation referred to as e-learning course. The e-learning course comprised seven units, one orientation unit and six learning units featuring different topics. The topics were: 1) Legal issues, Ethical issues, 3) External and internal factors, 4) Self-awareness and therapeutic relationship, 5) Teamwork, and 6) Integration of knowledge and practice. Several learning methods were used on this e-learning continuing education course; reading material (mandatory and optional), Power Point lectures with and without voice, virtual patients' cases, discussion, reading material for discussion, online chat option with tutors, assignments and reflective writing. This e-learning course was designed to be done unit by unit, so that a learned could not go to next unit before completing the preceding unit. Moreover, the content of this e-learning course was planned to start with more general knowledge and proceed to more detailed knowledge related to the care of distressed and disturbed patients. The course entailed 120 hours of work over a period of 3 to 6 months. See more detail in Papers II, III and IV. This e-learning course was planned so that it would affect students' attitudes and knowledge related to the care of aggressive patients. Moreover, the reflection exercise used was hoped to affect students' future behaviour when they have to deal with distressed and disturbed patients. (See Table 2.)

Table 2. Characteristics of the e-learning course.

Pedagogical approach	**Learning content of six units**	**Learning methods of six units**
Reflective learning	Unit 1: Legal implications regarding the management of distressed and disturbed patients	Unit 1: Reading material, Discussion forum, reflective journal, assignment, online-chat
Self-regulated learning	Unit 2: Ethical issues related to caring for distressed and disturbed patients	Unit 2: Reading material, Discussion forum, reflective journal, assignment
	Unit 3: Internal and external factors contributing to distress and disturbance in patients	Unit 3: Reading material, Discussion forum, reflective journal, assignment and virtual patient
	Unit 4: Understanding and knowledge of the role of self-awareness and interpersonal relationships	Unit 4: Reading material, Discussion forum, reflective journal, assignment and self-awareness exercise, online-chat
	Unit 5: The meaning of teamwork in managing distressed and disturbed behaviour in patients	Unit 5: Reading material, Discussion forum, teamwork exercise, reflective journal, assignment
	Unit 6: Integration of knowledge and practice	Unit 6: Reading material, Discussion forum, reflective journal, assignment and virtual patient

3. AIMS OF THE STUDY

The aim of the study was to use Kirkpatrick's four-level evaluation model (Kirkpatrick 1996, Kirkpatrick & Kirkpatrick 2006) to evaluate an e-learning continuing education course intended for psychiatric nurses. The sub-goals are as follows:

1. To describe nurses' reactions to a continuing education course using e-learning (Papers I, II, III, IV)
2. To explore nurses' learning and attitudes from e-learning continuing education course (Papers I, II, IV)
3. To evaluate nurses' behaviour after the e-learning continuing education course (Papers III, IV)
4. To evaluate results as practical implications of e-learning continuing education course from organisations perspective (Paper IV)

This study followed Kirkpatrick's evaluation model (see Figure 1.). The model includes four levels of evaluation: reactions, learning, behaviour and results. At level one, participants' reactions were described after the e-learning course (Papers I, II, II and IV). At level two, participants' learning and attitudes were explored after the e-learning course (Papers I, II, IV). At level three, the intention was to evaluate participants' behaviour change after the e-learning course (Papers III and IV). At level four the final results were evaluated as implications of the e-learning course (Paper IV). The outcome of this study is a detailed evaluation of the e-learning course in psychiatric nursing.

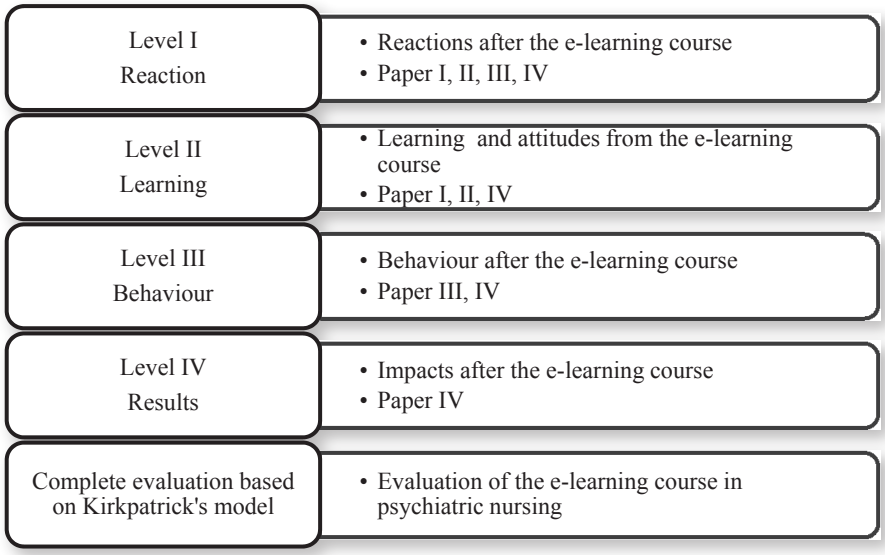

Figure 1. Evaluation process based on Kirkpatrick's evaluation model and study papers.

4. METHODOLOGY

4.1 Theoretical and methodological approaches

The theoretical approach of the study was based on Kirkpatrick's four level evaluation model (Kirkpatrick 1996, Kirkpatrick & Kirkpatrick 2006). In this study the evaluation model is divided into four levels as follows: 1) reaction i.e. satisfaction towards the e-learning education, 2) learning i.e. improvement of knowledge and attitudes after e-learning education, 3) behaviour i.e. knowledge transfer after e-learning education and 4) result i.e. final outcome after e-learning educational course. (Kirkpatrick 1996, Smidt et al. 2009.) (See Figure 2.)

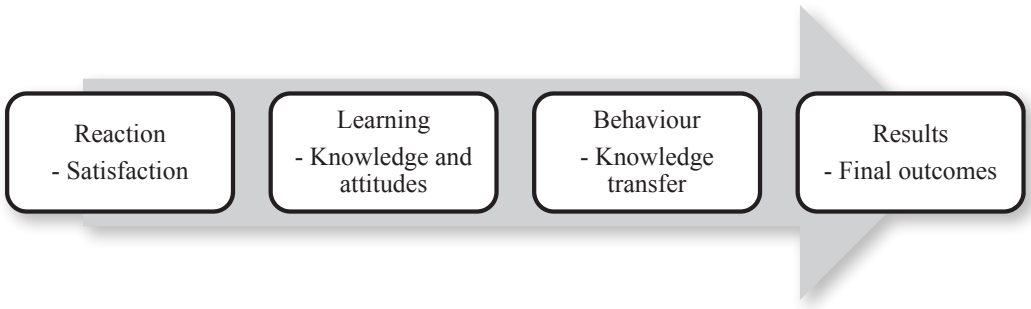

Figure 2. Levels of evaluation (Kirkpatrick 1996).

First, in this study reaction was defined as students' satisfaction with the course and it can also be described as feelings (Kirkpatrick 1996, Rouse et al. 2011). This was seen as a tangible outcome of an e-learning course reaction (Galloway 2005). In relation to students' reactions feelings were also studied and feelings are seen as one form of reaction (Kirkpatrick 1996). In addition, if students have favourable feelings towards an e-learning course they are more likely to learn (Kirkpatrick 1996). However, this does not mean that a good level of satisfaction will necessarily produce a good learning outcome (Kirkpatrick 1996, Rouse 2011). Reaction can be measured right after the training (Alliger & Janak 1989, Kirkpatrick 1996). Satisfaction surveys are a commonly used form of measurement (Hamtini 2008), likewise written comments (Kirkpatrick 1996) and feedback forms (Hamtini 2008). In this study nurses' reactions after the e-learning course were studied in four different papers. First, nurses' reactions were investigated as satisfaction with the e-learning course (Paper I). Second, nurses' reactions after the e-learning course as regards of better job-satisfaction were explored (Paper II). Third, nurses' reactions as regards of satisfaction with the e-learning course to the point of being willing to recommend it to others were described (Paper III). Fourth nurses'

reactions after the e-learning course described from the perspective of nurse managers were reported (Paper IV).

Second, in this study learning was defined as improvement in the level of knowledge, skills and attitudes (Kirkpatrick 1996). It is important to study knowledge and skills acquired from the course content to see how much the students learn (Kirkpatrick 1996, Hamtini 2008). However, although learning may occur after the e-learning course, this does not necessarily imply actual knowledge transfer (Galloway 2005). Learning can be measured right after the training (Alliger & Janak 1989, Kirkpatrick 1996). The measurements used are pre and post test and intervention and control group design (Kirkpatrick 1996) and also comparative analysis (Hamtini 2008). In this study nurses' learning after the e-learning course was studied in three different phases. First, nurses' learning was studied by comparing e-learning and conventional learning methods with respect to enhancement of knowledge and skills (Paper I). Second, nurses' learning and attitudes before and after the e-learning course as the primary outcome measure was nurses' knowledge of coercion-related legislation, physical restraint and seclusion were explored. Secondary outcome measures included nurses' attitudes towards physical restraint and seclusion and nurses general self-efficacy. (Paper II.) Third, nurses' learning and attitudes from nursing managers' point of view were described (Paper IV).

Third, in this study behaviour was seen as the extent to which nurses changed their behaviour in practice (Kirkpatrick 1996). It is essential to understand the actual knowledge transfer in terms of behaviour change to see whether the knowledge acquired on the e-learning course could be used in practice (Kirkpatrick 1996, Rouse 2011). Therefore nurses' knowledge transfer was studied as behaviour change to ascertain whether their behaviour changed after the e-learning course (Dyer 1994). Behaviour needs more time to change and it is recommended to measure it after some time (Alliger & Janak 1989, Kirkpatrick 1996). Behaviour change can be measured using surveys or by adopting a qualitative approach and directly eliciting the students' views (Kirkpatrick 1996). In this study changes in the nurses' behaviour after the e-learning course was studied in four different phases. First, nurses' behaviour change was studied in terms of knowledge transfer from the e-learning continuing education course to daily practice (Paper III). Second, what kind of behaviour the nursing managers perceived the nurses to have been transferring to clinical practice after e-learning continuing course were explored (Paper IV). Third, nurses' behaviour change was studied as regards what they would like to develop in their work after the e-learning continuing education course (Paper III). Fourth, what future behaviour changes the nursing managers would hope to see on the wards were reported (Paper IV).

Fourth, in this study, the results were seen as implications of e-learning course and this represent the final desired results of the e-learning course (Kirkpatrick 1996). Moreover,

the results showfrom organisations' perspective that the training has made a difference and impacted on the organisation (Kirkpatrick 1996, McNamara et al. 2010). Therefore the results are most often presented at the organisational level (Kirkpatrick 1996, Hamtini 2008) and the measurements used are, for example, managers' observations and opinions (Kirkpatrick & Kirkpatrick 2006, Hamtini 2008). The results need more time and it is recommended to measure these after some time (Alliger & Janak 1989, Kirkpatrick 1996) so that there has been sufficient opportunity for students to put into practice what they have learned, for example, by measuring it after three months or even longer (McNamara et al. 2010). In this study the implications of the e-learning course was studied from nursing managers' point of view. The managers described what implications they had observed on nurses' clinical work. This was divided into advantages, disadvantages and impacts of the e-learning course. (Paper IV.) See Table 3.

Table 3. Papers and Kirkpatrick's evaluation model levels of evaluation.

	Reaction	**Learning**	**Behaviour**	**Results**
Paper I	x	x		
Paper II	x	x		
Paper III	x		x	
Paper IV	x	x	x	x

The methodological approach of the study was evaluative (Rossi & Freeman 1993, Gray 2009). This research approach is usable when assessing, for example, e-learning course utility (Rossi & Freeman 1993, Gray 2009, Phillips et al. 2012). In taking an evaluative approach in this dissertation the purpose is to increase the understanding of a phenomenon by gathering information about the e-learning course (Phillips et al. 2012) and evaluating the e-learning at different levels (Gray 2009). The different levels of evaluation in this study are followed by Kirkpatrick's evaluation model; reaction, learning, behaviour and results (Kirkpatrick 1996, Kirkpatrick & Kirkpatrick 2006).

Mixed methods were used as a method for this study (Östlund et al. 2011, Grove et al. 2013). Mixed methods are normally defined as mixing the qualitative and quantitative approaches together (Yoshikawa et al. 2008). Mixed methods can be seen as a combination of different methods such as data collection, analysis and presentation of findings (Giddings 2006). However, when mixed methods are used in a single study priority is usually given to one of them (Östlund et al. 2011). A mixed methods approach is appropriate when either qualitative or quantitative methodology alone cannot answer the research question and one single source of data is not sufficient to understand the research phenomena (Wisdom et al. 2012). Moreover, mixed methods are usable when a single study uses mixed strategies or multiple techniques to answer the research question

or test hypotheses and arrive at a more profound understanding of a phenomenon (Kettles et al. 2011).

Mixed methods in this study means that both quantitative and qualitative research methods were used (Grove et al. 2013, Creswell 1994) to obtain answers to the research questions (Mertens 2005). This mixed methods approach was chosen because the study phenomena explored a complex healthcare question (Driessnack et al. 2007, Florczak et al. 2012) related to a sensitive topic (Renzetti & Lee 1993) namely evaluating an e-learning continuing education course on managing aggressive, distressed and disturbed patients in psychiatric hospitals in an ethically appropriate way. The mixed methods approach is applicable in mental health research. Multiple methods can be used to complete the overall picture by providing trends and generalizations as well as an in-depth picture of participants' perspectives to ensure that outcomes are achieved. (Kettles et al. 2011.)

In Paper I, in order to obtain a basic understanding of the effectiveness of e-learning, a systematic review was conducted to obtain information about the nurses' and nursing students' knowledge, skills and satisfaction related to e-learning compared to traditional teaching. This approach was chosen because there is a need for evidence of e-learning effects (Ruiz 2006, Cook et al. 2010). Moreover, a systematic review makes it possible to combine the findings of a single study using meta-analysis (Egger et al. 2001, Higgins & Green 2011). (Paper I.)

In Paper II, information from phase I was enhanced by carrying out a randomised controlled trial (RCT) to investigate the impact of the e-learning continuing education course among psychiatric nurses. Randomised controlled trial design was chosen because it is the strongest design for testing cause and effects (Moher et al. 2010, Melnyk & Morrison Beedy 2012). Using randomised controlled trial as a research method is appropriate when the target is a complex intervention (Hawe et al. 2006). (Paper II.)

In Paper III, in order to obtain a complete picture of the effects of the e-learning continuing education course survey as well as a qualitative content analysis of students' written texts writings on the e-learning course was conducted (Graneheim & Lundman 2004). This approach was chosen to obtain firsthand descriptions such as nurses' own voices of the knowledge transfer of e-learning to daily practice (Sandelowski 2000). (Paper III.)

In Paper IV, to complete the evaluation process of the e-learning continuing education and its effects, nursing managers' views were studied with qualitative methods. This approach was chosen to understand in the bigger picture the effect of the e-learning course in psychiatric organisations by asking other stakeholders' views than the participants of the e-learning course (Ruggeri et al. 2013). The study was carried out in psychiatric hospital organisations using qualitative content analysis of written text

from the managers' perspectives. It was important to understand from the nursing managers' views the reactions, learning, behaviour, and results as practical implications of the e-learning course (Gray 2009, Ruggeri et al. 2013). A qualitative approach was chosen to give a voice to those with experience of the phenomena under investigation (Sandelowski 2000). (Paper IV.)

4.2 Design and setting

In Paper I, a design of systematic review with meta-analysis (Egger et al. 2001, Glasziou et al. 2004) was conducted to investigate the impact of e-learning on nurses' and nursing students' satisfaction, knowledge and skills. Systematic review and meta-analysis are applicable when combining single studies together to obtain up-to-date summaries of the effects of health care interventions (Egger et al. 2001). Using meta-analysis helps when pooling together the results of earlier literature impact evaluation (Rossi & Freeman 1993). Electronic databases were included as follows: MEDLINE (1948-2010), CINAHL (1981-2010), Psychinfo (1967-2010) and Eric (1966-2010). Literature searches were conducted on May 2010 and updated in December 2010. (Paper I.)

In Paper II, a randomized controlled open label study design (Melnyk & Morrison-Beedy 2012) was used to evaluate the impacts of the e-learning continuing education course on nurses' job satisfaction, knowledge level and attitudes, and general self-efficacy. This approach is usable when testing an intervention and its cause and effect relationship (Melnyk & Morrison-Beedy 2012, Grove et al. 2013). The study was conducted on twelve acute wards in three psychiatric hospitals in Finland between January and May 2009. (Paper II.)

In Paper III, a descriptive design (Sandelowski 2000, Grove et al. 2013) with inductive content analysis (Graneheim & Lundham 2004, Hsieh & Shannon 2005) was used to assess psychiatric nurses' transfer of newly acquired knowledge from the e-learning continuing course to their daily work. A descriptive design approach was chosen because only little was known about the study topic (Gray 2009, Smith et al. 2011) and a more profound understanding was wanted of nurses' perspectives (Grove et al. 2013) on e-learning continuing education and transfers of knowledge to clinical work as they naturally occurs (Gray 2009). One hospital in Southern Finland and its three psychiatric wards (acute, rehabilitation and geriatric) was included in spring 2009. (Paper III.)

In Paper IV, a descriptive design (Sandelowski 2000, Smith et al. 2011) with inductive content analysis (Graneheim & Lundham 2004, Hsieh & Shannon 2005) was used after the e-learning continuing education to understand mental health managers' perspectives and its implications for the organization. This approach was chosen to gain new insight into the phenomenon (Gray 2009). The six psychiatric organisations and nine psychiatric

hospitals in Finland which participated in the e-learning continuing education course in the period 2008-2011 were included. (Paper IV.) (See figure 3.)

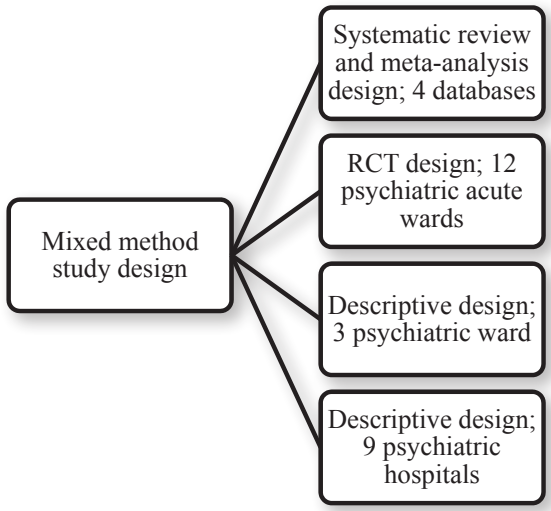

Figure 3. Overall design of this study.

4.3 Sampling

In Paper I, selective sampling based on inclusion criteria was used (Grove et al. 2013). All RCT studies evaluating the effectiveness of e-learning and comparing between traditional learning methods among nurses and nursing students were included in the systematic literature review. Data were selected according to data inclusion criteria:1) the study population was nurses or nursing students, 2) the intervention used was e-learning, 3) traditional education included face-to-face teaching and 4) increase of knowledge, skills and satisfaction was listed as outcomes. Altogether 11 studies were included in the review. (Paper I.)

In paper II, random sampling (Melnyk & Morrison-Beedy 2012) was used based on power calculations (Moher et al. 2005, Merrifiel & Smith 2012). Power calculations were used to estimate the right number of nurses in the intervention and education as usual groups to have a significance level and effect size in outcomes. Power calculation was done with the primary outcome measure nurses' knowledge of the legislation on coercion, physical restraint and seclusion. As a result of the power calculation the study sample included 158 nurses. Random sampling was conducted using a coin; at ward level (wards were included if they were not involved in any other seclusion and restraint research or development project and if they were psychiatric acute inpatient wards practising seclusion and restraint). The inclusion criteria were: qualified nurses (head nurse, deputy head nurse, registered nurse or mental health nurse), having a permanent

or long-term (over 3 months) employment contract on one of the study wards, over 18 years of age, sufficient Finnish language proficiency and willingness to participate. The nurses (at baseline n=228, at follow-up n=158) on twelve psychiatric acute wards were randomly assigned to the e-learning continuing education course (n=115, intervention group) or continuing education as usual (n=113, education as usual group). Nurses in the e-learning continuing education group completed the e-learning course described in Chapter 2.5 in this dissertation. The education as usual group received the normal continuing education that was offered during the data collection period for this study in the respective organisations. Basically, the continuing education as usual offered in the ward was fragmentary and irregular including different topics related to psychiatric care. No specific details related to education as usual were collected during this study. Moreover, participants in the education as usual group were allowed to take whatever continuing education they wanted. The flowchart of the participant in the randomized controlled study is presented in Figure 1, Paper II. (Paper II.)

In Paper III, convenience comprehensive sampling was used (Gray 2009, Grove et al. 2013). This approach is a suitable method in qualitative research when one participant group from a certain location or group is selected to be the research object (Curtis et al. 2000, Grove et al. 2013). Recruitment of nurses was in spring 2009 and all nurses (N=53) on the study wards were invited to participate in the e-learning continuing education course. Inclusion criteria were as follows: registered nurse, working in a permanent position and over eighteen years old. Out of 53 nurses 35 participated in the e-learning continuing education course and 33 of these completed the course. Voluntary course participants were asked to complete the course evaluation form and essay assignment (N = 35). (Paper III.)

In Paper IV, purposive sampling method was used (Gray 2009, Grove et al. 2013). This sampling method is useful when participants hold information needed in research (Higginbottom 2004, Gray 2009). The study population was all in Finnish speaking psychiatric organizations nursing managers (nursing directors, nurse managers_and deputy nurse managers) from the wards where the e-learning continuing education course (ePsychNurse.Net) was offered in the period 2008-2011. Exclusion criteria were short-term substitute's employment contract (under 3 months). Of the managers invited (N=48), 28 participated in the study. (Paper IV.)

4.4 Instruments and data collection

In Paper I, managing the data was done according to the "Cochrane Handbook for Systematic Reviews of Interventions". Assessment of eligibility of studies and extraction of data from study reports followed the Cochrane guideline. (Higgins & Green 2011.) The data extraction sheet included five points; 1) Methods, 2) Participants, 3) Intervention, 4) Outcomes, and 5) Notes. Altogether, 11 trials were eligible for inclusion. (Figure 1, Paper I.)

In Paper I, the studies included were retrieved from electronic databases; MEDLINE (1948-2010), CINAHL (1981-2010), Psychinfo (1967-2010) and Eric (1966-2010). The data collection form to obtain research studies from databases was according to the "Cochrane Handbook for Systematic Reviews of Interventions" (Higgins & Green 2011). Data was collected using PICO search words (Stone 2002). Data collection was conducted on May 2010 and updated in December 2010. (Paper I.)

In Paper II, structured questionnaires were used. To ensure as high a response rate as possible questionnaires were k6ept short enough, as recommended, a maximum length of six pages (Gray 2009). For the primary outcome measurement three instruments were used; 1) "Knowledge of coercion-related legislation", 2) "Knowledge of physical restraint" and 3) "Knowledge of seclusion" (Janelli et al. 1992, Immonen 2005). The secondary measurements were: 1) The Physical Restraint Questionnaire Attitude Scale (Janelli et al. 1992) was used to evaluate nurses' attitudes to physical restraint, 2) The Job Satisfaction Scale (Vartiainen 1986) was used to evaluate nurses' job satisfaction and 3) The General Self-Efficacy Scale (Jerusalem & Schwarzer 1992) was used to evaluate nurses' general self-efficacy (i.e. experience of own capability as a nurse). The details of the measurement instruments used in Paper II are given in Tables 1 and 3. (Paper II.)

In Paper II, data were collected at baseline (two weeks before the intervention) and immediately after finishing the e-learning course (after three months) (Melnyk & Morrison-Beedy 2012). The response time allowed was two weeks. Questionnaires were completed by pencil-and-paper copy (Grove et al. 2013). The completed questionnaires were collected on the wards and picked up by the researchers. (Paper II.)

In Paper III, a questionnaire developed for the study and a closed e-learning course platform assignment were used as data collection instruments. The questionnaire contained open-ended and multiple-choice questions and background information. There were five multiple-choice questions related to course management and content and six open-ended questions related to the course content. Background information included seven questions related to sex, age, work position and continuing education taken. In phase III, one open-ended question and one structured dichotomous (yes/no) question were analysed. One assignment essey from e-learning platform (Moodle) was used. (Paper III.)

In Paper III, data was collected from the e-learning course evaluation form (n=35) after the e-learning course as pencil-and-paper copy and from the sixth reflective essay written on the e-learning course platform as online electronic copy (Grove et al. 2013). From e-learning course evaluation form one open ended question was answered related to psychiatric nurses' transfer of knowledge to their daily work after participating in the e-learning continuing education course and one yes/no question related to recommending the course. From the closed e-learning platform one assignment (n=35) was used to answer the question related to what psychiatric nurses would develop in their daily work

after participating in the e-learning continuing education course. The response time was two weeks after the course and for completing the assignment in the e-learning course was one week. The completed questionnaires were placed in sealed envelopes and placed in a locked box for the researchers to collect. (Paper III.)

In Paper IV, a structured questionnaire developed for the study with open-ended questions was used to collect qualitative data from nursing managers in psychiatric organisations. The questionnaire consisted nine questions on nurses' reactions, knowledge, attitudes, advantages and disadvantages of the course to the organization, use of knowledge in daily practice, knowledge transfer the nursing managers still hoped see, how the course was seen in clinical practice and the meaning of the course for clinical practice. Background information was collected and included six questions related to sex, age, work position, managerial experience and participation in the e-learning course. Structured questionnaire with open-ended questions was pretested on one nurse manger to ensure its comprehensibility and ease of use (Gray 2009). (Paper IV.)

In Paper IV, data collection was started by asking contact persons in each psychiatric organisation to locate all nursing managers fulfilling the inclusion criteria and forward their email addresses to the researcher. Data were collected electronically using Webropol 2.0 online survey tool (https://www.webropolsurveys.com/ (Gordon & McNew 2008, Chizawsky et al. 2011). The researcher emailed the managers information about the study (purpose, aims, methods, practical information and voluntary nature of the study) to inform participants about the study (Grove et al. 2013). A link to the electronic questionnaire was also included. In one organisation the contact persons were responsible for sending the information and questionnaire to the participants due to hospital policy. The participants also gave written informed consent via the Webropol questionnaire. Response time was two weeks and after that two reminders were sent. Answers were read straight after the second reminder. (Paper IV.)

4.5 Data analysis

In Paper I, data was analysed using a meta-analysis method in systematic review (Higgins & Green 2011) to investigate the effects of the e-learning course on nurses' and nursing students' knowledge, skills and satisfaction compared to conventional teaching methods. The data from the studies included was first entered into Review Manager 5.1 (RevMan), which is the Cochrane Review software used for preparing and maintaining data. Secondly, the data analysis was divided into two phases; 1) the descriptive characteristics of the individual studies included were analysed 2) mean differences (MD) between groups for continuous outcomes were estimated. Thirdly, effect sizes were calculated from the mean differences in post-test scores (Ray & Shadish 1996). Random effect was used because it allows the outcomes of studies to vary more than

fixed effects. In other words, for a more natural way of explaining outcome random effects can be used. (Ades & Higgins 2005.) Fourth, checking for I^2 – square statistics for heterogeneity was calculating (Higgns & Green 2011). (Paper I.)

In Paper II, data were analysed using statistical methods (Kalinowski & Fidler 2010, Gaskin & Happell 2013). Data were analysed at baseline and immediately after the e-learning course (3 months), this is recommended so that participants have had an opportunity to put into practice what they have learned from e-learning course (McNamara et al. 2010). At baseline background characteristics between groups were compared and descriptive statistics were used. For continuous variables one-way analysis of variance (ANOVA) was used. For categorised variables chi-square test was used. Paired T–test were used to analyse difference in change in nurses knowledge, attitudes, job satisfaction and general self-efficacy between the intervention and the education as usual group at three months mean score. Repeated measurements ANOVA was used to calculate changes in with group and measurement interaction effect. To measure effect, effect size Partial Eta-squared was used. Mean score changes were analysed using Paired T-tests to analyse nurses' knowledge, attitudes, job satisfaction and self-efficacy in groups at three month follow-up. In all analyses a p value of <0.05 was set to be statistically significant. SPSS version 16.0 was used (SPSS Inc. Released 2007). (Paper II.)

In Paper III, the qualitative data, from an open-ended question and one assignment was analysed using qualitative inductive content analysis (Graneheim and Lundman, 2004). A conventional approach (Hsieh & Shannon 2005) was used to describe psychiatric nurses' knowledge transfer from e-learning course to daily practice. The purpose was to break the data down into smaller units so that their elements and structure could be revealed (Gray 2009). Data was read thorough carefully to obtain understanding of the complete picture of how the data was structured. Word, sentence or part of a sentence with content relevant to the research question was set as the meaningful unit of analysis. Coding was then done by asking a research question and sorting out meaningful units to answer that question. The codes were then put into categories. The data was also reanalysed to ensure that the context of the categories was accurate (Graneheim and Lundman 2004). One dichotomous question (yes/no) in evaluation form was analysed by calculating the number of yes answers and no answers. (Paper III.)

In Paper IV, the structured qualitative data were analysed according to Kirkpatrick's four-level model (Kirkpatrick 1996) to evaluate psychiatric organisation nursing managers' perceptions of the e-learning continuing education course. The analyses were conducted by qualitative conventional inductive content analysis (Graneheim and Lundman 2004, Hsieh & Shannon 2005), a useful approach when there is limited information available on the phenomena (Hsieh &Shannon 2005). The questions posed to the participants were divided according to Kirkpatrick's model referring to Hsieh & Shannon (2005)

direct analysis, but the responses to each question were categorized according to the Hsieh & Shannon (2005) conventional approach. This permits inferences about the data by systematically identifying special characteristics (Gray 2009). The texts were read to understand the context and then coded sentence-by-sentence to capture key thoughts or concepts. Codes were named and organised into categories. Categories were named. If there were any breaks during the analysis process, texts were reanalysed to ensure the consistency of the text (Miles and Huberman 1984). (Paper IV.)

4.6 Ethical considerations

The basic principles of research ethics were followed at every stage of the study (The Nuremberg Code 1949, ETENE 2001, TENK 2002, Ministry of Social Affairs and Health 2007, TUKIJA 2011, Declaration of Helsinki 2013) as well as the legal and ethical principles prescribed in the relevant legislation (Medical Research Act 1999/488). Ethical aspects have been discussed in this doctoral dissertation related to the purpose of the study, design, data collection and analysis and also the presentation of the results (Grove et al. 2013). Ethical principles such as avoiding harm to participants, ensuring informed consent, respecting privacy and avoiding deception (Gray 2009) were followed in this research. Special attention was paid to the ethical aspects of mental health research and professional development in the field of mental health nursing (ETENE 2009). All data collected during this doctoral dissertation research process were stored and handled in an appropriate way (Archive Act 1994/831, Constitutional Act 1999/731, Kuula 2006, Personal Data Act 1999/523). Data were protected at all stages of the study from deliberate destruction, unintentional or unauthorized revision and inappropriate disclosure or use in accordance with established policies and practices (Archive Act 1994/831, Kuula 2006).

In Paper II, the study protocol was registered (ISRCTN32869544) and then approved by the ethics committee of the hospital district. Permission for data collection was obtained from the organisations' authorities. Permission to use instruments and questionnaires was requested from the original developers. Instruments and questionnaires were translated into English using the from and back-translation system (Jones et al. 2001). Oral and written information about the purpose of the study was given to the participants beforehand and their rights were discussed. The principles of good research ethics were followed at every stage of the research (Academy of Finland 2003). It was highlighted that participation in the research was voluntary and refusal would not affect the participants' working conditions. Informed consent was obtained. (Nelson et al. 2011.) The data were handled in confidence and anonymity of the participants' was ensured by encrypting the data during the analysis. (Paper II.)

In Paper III, the principles of good research ethics were followed throughout the study (World Medical Association, 2012). Permission for this research was obtained from the

local ethics committee and permission to collect the data was obtained from the hospital director of nursing and the medical director (73/E7/2007, TMKE7, § 50, 13.3.2007). Participation was voluntary and anonymous, and the data were treated in confidence. Participants gave written informed consent after receiving oral and written information (Nelson et al. 2011). (Paper III.)

In Paper IV, permission for this research was obtained from the local university ethics committee and permission for data collection was obtained from six hospital research permission committees. Participation was voluntary and data were treated in confidence. Participants were given information on the study by email before they completed the Webrobol questionnaire. Direct work related e-mail addresses were obtained to ensure that the person really was the one s/he was supposed to be. Special ethical issues regarding the use of digital technology in data collection were duly addressed, such as gaining consent, respecting privacy, ensuring anonymity and avoiding misinterpretation in data analysis. (Gray 2009.) Moreover, e-health ethical guidelines were followed throughout the study (Rippen & Risk 2000). (Paper IV.) (See table 4.)

Table 4. Summary of ethical issues.

	Paper II	Paper III	Paper IV
Ethics committee	X	X	X
Research permission	X		X
Permission to use instrument	X		
Voluntary participation	X	X	X
Informed consent	X	X	X
Written information to participants	X	X	X
Oral information to the participants	X	X	

4.7 Summary of methodology

In summary, the methodology used in this study was mixed methods, and Kirkpatrick's evaluation model was used as a theoretical approach. Kirkpatrick's model was used as a frame for the study exploring nurses' reactions, learning, behaviour and the results of the e-learning course. The focus of this study was nurses' and nursing managers in psychiatric hospitals. Both qualitative and quantitative designs were used. Several different methods were used to collect and analyse the data related to nurses' reactions, learning, behaviour and results after e-learning course. (See Table 5.)

Table 5. Summary of the methodology of the study divided by Kirkpatrick's evaluation model.

	Design	Setting	Sampling	Sample	Instrument	Data collection	Data analysis
Reactions	Systematic review Randomised controlled trial Qualitative study	Databases Twelve acute wards in three psychiatric hospitals Three psychiatric ward in one psychiatric hospital Six psychiatric hospitals	Selective sampling Random sampling Purposive sampling	Medline, Cinahl, PsychInfo, Eric Nurses (n=158) Nurses (n=35) Managers (n=28)	Data extraction sheet The Job Satisfaction Scale E-learning evaluation form E-learning course assignment (sixth reflective writing) Structured open-ended questionnaire	Systematic literature search Self-administered survey Course writing Electronic Webropol survey	Meta-analysis Descriptive statistics Chi-Square test T-test one-way ANOVA Post-hoc Tukey & Tamhane Repeated measures ANOVA Partial Eta-squared test Inductive content analysis
Learning	Systematic review Randomised controlled trial Qualitative study	Databases Twelve acute wards in three psychiatric hospitals Six psychiatric hospitals	Selective sampling Random sampling Purposive sampling	Medline, Cinahl, PsychInfo, Eric Nurses (n=158) Managers (n=28)	Data extraction sheet Knowledge of coercion-related legislation Knowledge of physical restraint Knowledge of seclusion The Physical Restraint Questionnaire Attitude Scale The General Self-Efficacy Scale Structured open-ended questionnaire	Systematic literature search Self-administered survey Electronic Webropol survey	Meta-analysis Descriptive statistics Chi-Square test T-test one-way ANOVA Post-hoc Tukey & Tamhane Repeated measures ANOVA Partial Eta-squared test Inductive content analysis
Behaviour	Qualitative study	Three psychiatric ward in one psychiatric hospital Six psychiatric hospitals	Purposive sampling	Nurses (n=35) Managers (n=28)	E-learning evaluation form E-learning course assignment (sixth reflective writing) Structured open-ended questionnaire	Self-administered survey Course writing Electronic Webropol survey	Descriptive statistics Inductive content analysis
Results	Qualitative study	Six psychiatric hospitals	Purposive sampling	Managers (n=28)	Structured open-ended questionnaire	Electronic Webropol survey	Inductive content analysis

5. RESULTS

The results of this study are reported in four parts according to the sub-goals presented and presenting the participants of the study. The first part describes characteristics of participants in this study. The second part describes nurses' reactions after the e-learning course (Papers I, II, III, IV). The third part describes nurses' learning after the e-learning course (Papers I, II, IV). The fourth part describes nurses' behaviour change after the e-learning course (Papers III, IV). The fifth part describes nurses' impacts as result of the e-learning course (Paper IV). Papers II, III and IV are concerned with the e-learning continuing education course described in chapter 2.5.

5.1 Characteristics of participants

In Paper II, participants were randomly divided into two groups. At follow-up in the final analysis there were 95 participants in the intervention group i.e. e-learning continuing education group (n=95) and 63 in the education as usual group (n=63). No statistically significant differences were found between groups at baseline measurement. There were slightly more females in both groups. Participants' mean age ranged from 43 to 45 and working experience in the psychiatric field was 16-17 years in both groups. In the intervention group nurses composed the largest group of respondents (53%) and in the education as usual group mental health nurses were the largest group (47%). In both groups participants had previously participated in continuing education in the field of mental health and coercive measures. Almost all the participants in both groups had experienced violence at the workplace. (Paper II.)

In Paper III, the most respondents were female and their mean age was 40 years. Their average working experience in the psychiatric field was 14 years. Most participants were registered nurses. Most of the participants (62%) had participated previously in continuing education related to mental health. All participants had experienced violence at the workplace. (Paper III.)

In Paper IV, out of all participants (N = 28), most were female. Mean age was 47 and their average managerial working experience was 10 years. Most of the participants were ward managers or deputy ward managers. Only (n=6) were nursing directors. Over half (57%) of the participants had themselves participated in e-learning continuing education presented in this study. (Paper IV.)

To summarise the participants in Papers II, III and IV, most were female, and their mean age was around 43 years. Their average working experience was between 14 and 17 years. Only in Paper IV, was managerial working experience elicited and in this the managers

had on average 10 years' experience. The participants represented all staff members working on psychiatric wards and at managerial level. Most participants had taken part in the ePsychNurse.Net e-learning course and had also participated in some kind of continuing education related to mental health care. Moreover, some of the participants had participated in continuing education related specifically to coercion (paper II). Almost all participants (Papers II, III) had experienced violence at the workplace. See characteristics of participants in Papers II, III and IV in more detail in Table 6.

Table 6. Characteristics of participants (Paper II, III, IV).

	Paper II N (%)		**Paper III** N (%)	**Paper IV** N (%)
	Intervention	Control		
Gender				
Male	43 (45)	30 (48)	9 (27)	9 (32)
Female	52 (55)	33 (52)	25 (73)	19 (68)
Age (mean/range)	43 (25–60)	45 (24–64)	40 (24–56)	47 (31–61)
Working experience in years	16 (1–35)	17 (1–37)	14 (1–33)	–
Work position				
Mental health nurse	36 (38)	30 (47)	19 (56)	–
Nurse	50 (53)	25 (40)	11 (32)	–
Ward manager / Ward deputy manager	9 (9)	8 (13)	2 (6)	19 (68)
Nursing director	–	–	–	6 (21)
Other	–	–	2 (6)	3 (11)
Participated in ePsychNurse.Net				
Yes	95 (60)	–	34 (100)	16 (57)
No	–	63 (40)	–	12 (43)
Participated in continuing education on mental health				
Yes	56 (64)	46 (78)	20 (62)	–
No	32 (36)	13 (22)	12 (38)	–
Participated in continuing education on coercion				
Yes	52 (57)	37 (63)	–	–
No	40 (43)	22 (37)	–	–
Experiences violence at work				
Yes	95 (100)	61 (98)	34 (100)	–
No		1 (2)		–

5.2 Reactions to the e-learning course; nurses and nursing managers view

Nurses and nursing students' reactions emerged as increased satisfaction after the e-learning course compared to traditional teaching. The systematic review and qualitative analysis of (n=3) studies showed that students were mostly more satisfied with e-learning than conventional learning methods. Nurses' and nursing students who participated in the e-learning course reported that they were more willing to accept the e-learning course (Tsai et al. 2004). Moreover, students on the e-learning course reported high level of satisfaction, for example with the easy navigation and content delivery (McVey et al. 2009). In addition, Horiuchi et al. (2009) reported in their study that the drop-out rate was lower in the e-learning group (18%) than in the face-to-face group (31%). (Paper I.) Also, the drop-out rate was statistically significantly lower (p=0.001) among the e-learning group than in the education as usual group (Paper II).

Nurses' reactions were also studied in a randomised controlled trial as better job satisfaction related to e-learning continuing education course compared to education as usual. The results yielded no statistical difference (p=0.08 [e-learning group t=1.1, p=0.271, education as usual group t=1.4, p=0.177]) between groups in mean scores in follow-up measures between e-learning (Mean = 5.18) and education as usual (Mean = 5.25). However, the nurses in the e-learning group had higher pre-scores (Mean = 5.23) in job satisfaction than those in the education as usual group (Mean = 5.18). Hence, job satisfaction scores were relatively high in both groups as seven would mean good job satisfaction. For more detail see Table 3 in Paper II. (Paper II.)

Nurses' reactions to the e-learning course were asked as means of satisfaction and asking whether they would recommend the e-learning course in which they had participated to other nurses. A great majority of the nurses responded that they would recommend e-learning course to others (96%). Only one nurse reported that he would not recommend this e-learning course to other nurses. (Paper III.)

Nurses' reactions were investigated by asking nursing managers that what kind of reaction they had noticed in nurses after they have participated in the e-learning continuing education course. The nursing managers reported nurses' reactions were positive, neutral and negative. Several positive reactions were observed such as enthusiasm, motivation and fascination. But also some negative reactions were also reported, among them anger, fear, doubt, resistance, irritation, underestimation, feelings of being coerced, distraction or laziness. On the other hand, there were also some neutral reactions among the nurses, such as neutral or expectant feelings about the course. The nursing managers pointed out as positive reactions that the nurses discussed more after the e-learning continuing education course, especially related to its content. Moreover, there was more use of reflection of nurses' own work. The managers reported that the nurses were more willing to use alternative methods to avoid aggression on the wards. The managers also pointed

out that the nurses had favourable attitudes to developing their work after the e-learning course. The nursing managers reported some negative reactions among the nurses after e-learning continuing education course, namely that some nurses were distressed about the course and its assignments. Moreover, managers felt that some of the nurses resisted the e-learning course and that the new learning method raised anxiety among nurses. On the other hand, some nurses had felt coerced to participate. The managers also pointed out that the nurses had doubts about the e-learning continuing course and reported that there was laziness during the course. (Paper IV.)

5.3 Learning from the e-learning course; nurses and nursing managers view

The nurses' learning in terms of an increase of knowledge and skills after e-learning were investigated as part of the systematic literature review, where eleven studies reported knowledge and skills as outcome. However, only eight studies compared e-learning and conventional learning and of these only four were eligible for meta-analysis. No statistically significance results were found (p=0.39, MD 0.44, 95% CI –0.57 to 1.46) when comparing e-learning to traditional learning. However, there was slight positive impact on e-learning. Heterogeneity I^2 = 27% suggested that the intervention were eligible fort meta-analysis. This is presented in more detailed in Paper I, Figure 3. On the other hand, four studies in the systematic literature review reported skills as outcomes when comparing e-learning to traditional learning. However, only one study reported the data in a form amenable to meta-analysis. This showed no statistical significance (p=0.13, MD 0.03, 95% CI –0.09 to 0.69) even though it slightly favoured e-learning. (Paper I.)

Nurses' learning as improved level of knowledge about the legislation on coercion, physical restraint and seclusion was studied in a randomised controlled trial. The results showed that the primary outcome measure, nurses' knowledge of the legislation on coercion, physical restraint and seclusion, showed no statistically significant difference. However, in the within-group analysis, knowledge of the physical restraint improved in both the e-learning and education as usual groups (p= 0.001 in each group [e-learning group t=4.6, p=0.000, education as usual group t=3.8, p=0.000]). In addition, knowledge of the coercion related legislation in the e-learning group improved (p=0.036 [e-learning group t=2.1, p=0.036]), likewise general self-efficacy (p=0.046 [e-learning group t=2.0, p=0.046]). No other statistically significant changes were found. See more detail in Table 3, Paper II. (Paper II.)

Nurses' learning as improvement in attitudes to physical restraint and seclusion were studied in a randomised controlled trial. The results showed no statistical difference in attitudes related to physical restraint between e-learning and education as usual. However, attitudes toward seclusion showed a statistically significant difference in changes between groups favouring the education as usual group (p=0,007). See more detail in Table 3, Paper II. (Paper II.)

Nurses' learning in terms of knowledge were studied from the nursing managers' point of view. The managers reported what kind of learning they had observed among the nurses after they had participated in the e-learning course. The managers' observations were categorised into seven categories: 1) Internationality, 2) Mental Health Act, 3) Ethical issues, 4) Treatment of aggressive patients, 5) Alternative methods, 6) Knowledge level and, 7) Discussion about the course content. These categories partly followed the e-learning course content as the nurses learned more about international aspects related to mental health care, the relevant legislation on patient care on psychiatric wards, ethical issues and how to cope with aggressive patients. Moreover, from the managers' point of view the nurses learned more about the use of alternative methods to avoid aggressive situations on the ward. Further, nurses' discussion about the course topics supported the learning after the e-learning course. See Table 7. (Paper IV.)

Change in the nurses' attitudes was studied from the nursing managers' perspectives. The managers reported a change in the nurses attitudes after they had participated in the e-learning course. The nursing managers reported changes in attitudes in four categories: 1) Nurses' awareness of their own attitudes, 2) Change in attitudes, 3) Attitudes toward patient care and, 4) Reduction in coercion. The managers reported that nurses' awareness of their own attitudes changed. This may have been helped because the course content includes several reflective exercises. The managers also described how the overall atmosphere and attitudes towards aggressive patients became more positive. In addition, the managers also noticed that the nurses' attitudes towards patient care and treating patients became more individualistic and collaborative. Interestingly, the managers also pointed out that the nurses' attitudes towards the use of alternative methods became more positive and willing. The main point in the managers' observation was that they felt that the use of coercion diminished after the course. See Table 7. (Paper IV.)

Table 7. Summary of nurses' learning related to knowledge and attitudes from the managers' perspective (Paper IV).

Nurses' learning related to knowledge from managers' perspective after the e-learning course	**Nurses' learning related to attitudes from managers' perspective after the e-learning course**
Internationality	Nurses' awareness of their own attitudes
Mental Health Act	Change in attitudes
Ethical issues	Attitudes toward patient care
Treatment of aggressive patients	Reduction in coercion
Alternative methods	
Knowledge level	
Discussion about the course content	

5.4 Behaviour changes after the e-learning course; nurses and nursing managers view

Changes in the nurses' behaviour after the e-learning continuing education course were studied in terms of knowledge transfer to daily practice. The nurses identified four categories related to knowledge transfer: 1) Knowledge about the course themes, 2) Communication and co-operation among staff members, 3) Understanding of preventive and alternative treatment methods and, 4) Critical thinking regarding own work. The nurses reported that knowledge was transferable from the topics of the e-learning continuing education course (for example legal issues, ethical issues, internal and external issues, team work and integration of knowledge) and the nurses also reported that they had been using what they had learned on a daily basis. Moreover, the nurses found that they were able to brush up their existing knowledge by participating in the e-learning course. The nurses pointed out that co-operation and communication were something what they were able to transfer to daily practice. In addition, the nurses reported that that they were able to transfer to their daily practice what they had learned about alternative treatment methods to prevent coercive measures on psychiatric wards. The nurses also reported that critical thinking acquired on the e-learning continuing education course was something what they were able to transfer to daily practice. (Paper III.)

The changes in the nurses' behaviour in terms of knowledge transfer after the e-learning continuing education course as perceived by the nursing managers was divided into seven categories: 1) Legislation on coercion, 2) Nursing distressed and disturbed patients, 3) Alternative methods to reduce coercion, 4) Anticipation of aggressive situations, 5) De-briefing, 6) Teamwork and, 7) Common discussions. These categories followed slightly the themes of the e-learning course (legal, ethical, internal and external factors, self-awareness, teamwork and integration of knowledge). The nurse managers from psychiatric hospital settings reported that the nurses had a better understanding of the legislation on coercion. They also pointed out that the nurses' actions changed and that they were more willing to co-operate with distressed and disturbed patients. For example they increased outdoor activities with patients and involved them in decision-making processes. The managers also reported that they had seen nurses trying more to anticipate aggressive situations. Moreover, the managers reported an increase in nurse-nurse and nurse-patient discussion, and also that de-briefing was more systematic and that teamwork changed after the course. (Paper IV.) See Table 8.

Table 8. Knowledge transfer from nurses and nursing managers' perspective (Papers III, IV).

Nurses knowledge transfer to daily practice (Paper III)	• Knowledge about course themes • Communication and co-operation among staff members • Understanding of preventive and alternative treatment methods • Critical thinking about own work
Nurses knowledge transfer to daily practice from the nursing managers' point of view (Paper IV)	• Legislation on coercion • Nursing distressed and disturbed patients • Alternative methods to reduce coercion • Anticipation of aggressive situations • De-briefing • Teamwork • Common discussion

Changes in nurses' behaviour were studied in terms of what nurses would wish to develop after participating in the e-learning continuing education course. The nurses' descriptions of how they would develop their own work after participating in the e-learning continuing education course were formed into six categories as follows: 1) Staff members' work, 2) The patient's role, 3) Alternative methods to avoid coercion, 4) Environmental issues, 5) Education and, 6) An action plan for aggressive situations. First the nurses mentioned things in their own work to be developed such as use of constant observation and a primary nurse system but also resources and time for the patient. Moreover, the nurses wanted to develop their education, their own attitudes and actions related to coercive methods. In addition, the nurses pointed out that one issue to be developed in their own work was their own strengths, motivation and work experience. Second, the nurses reported development issues relating to raising the awareness of the patient's right to self-determination but also having the patient participate in his/her own care. Moreover, nurses reported that taking care of the patient's needs, listening to the patient, showing respect, having active discussions and doing something meaningful with the patient was something to develop in future. Third, the nurses reported that they would like to develop alternative methods to avoid coercion, such as the use of preventive medications. The nurses reported that they would like to use softer, experimental, new ways to cope with patients in aggressive situations. They also mentioned the need to develop communication between nurse and patient and the role of de-briefing. Fourth, the nurses wanted a more homelike ward environment, quiet rooms and music rooms on the wards where patients could calm down. The nurses also wanted to develop the ward structure so that there would be a safe environment with single rooms to serve patient autonomy and privacy. Fifth, the nurses wanted to develop their education on coping with aggressive patients to improve practice on the wards. They also wanted to develop the use of research and understanding of hard psychiatry together with the use

of evidence-based knowledge. The nurses appreciated daily education and orientation program from new nurses. Lastly, the nurses thought that common rules, an action plan for aggressive situations and guidelines were important in future care but also wanted to develop the prevention of aggressive behaviour among patients. They also pointed out that it is important to develop care plans, reporting and leadership in their daily work. (Paper III.)

Changes in the nurses' behaviour was studied in terms of what nursing managers hoped to see nurses developing and what knowledge they hoped would be transferred from the e-learning continuing education course. The nursing managers hoped that there would be knowledge transfer from the e-learning course to the daily work of nurses and seven categories were formed: 1) Prevention of aggressive situations, 2) Holistic patient care, 3) Evidence-based care, 4) Understanding of mental illness, 5) Use of reflection, 6) Development in attitudes toward coercion and, 7) Increase in discussion. The nursing managers hoped that the nurses would use more different preventive and alternative methods to prevent aggressive incidents on the wards. More precisely, they hoped that the future nursing of distressed and disturbed patients could be more holistic. Managers also reported that they would like nurses to use more evidence based knowledge and interventions in their everyday practice. In addition, the managers pointed out that nurses' understanding of mental illness could be better in future. The managers perceived that after the e-learning course the nurses were able to use more reflection in their work, but also that attitudes towards the use of coercion could be revised. Even though discussion increased the managers hoped that discussion and communication could be further increased in future. (Paper IV.) See Table 9.

Table 9. Nurses' and nursing managers' development suggestions (Papers III, IV).

Nurses' development suggestions (Paper III)	• Staff members' work • Patient's role • Alternative methods to avoid coercion • Environmental issues • Education • Action plan for aggressive situations
Nursing managers' development issues for nurses in future (Paper IV)	• Prevention of aggressive situation • Holistic patient care • Evidence-based care • Understanding of mental illness • Use of reflection • Development in attitudes to coercion • Increase in discussion

5.5 Implications as results of e-learning course; nursing managers view

Impacts as a result of e-learning were studied by eliciting the views of psychiatric hospital organisation managers of the results of the e-learning course. The managers described the advantages of the e-learning continuing education course related to co-operation, anticipation of aggression, overall difference in attitudes, acknowledge patient, awareness of one's own work and, new knowledge. The disadvantages mentioned included time consuming and the need for substitute nurses on the wards while the nurses were participating in the e-learning course. The managers reported that nurses who had participated in the e-learning continuing education course were making greater use of co-operation among nurses and patients. Interestingly, anticipation of aggressive situations was seen as among the advantages of the e-learning course. Similarly, the managers reported that nurses treated patients more humanely and that they knew more about caring for aggressive patients. In addition, the managers also observed that nurses' attitudes had changed during the e-learning course. (Paper IV.)

The nursing managers in psychiatric hospital settings described impacts as the final result from the e-learning course. Ten categories were identified related to the implications of the e-learning course: 1) Team collaboration, 2) New tools for clinical practice, 3) Close observation nurse, 4) Reduction of isolation, 5) Humanity in coercion, 6) Nurses' awareness of their work, 7) Appreciation of development, 8) Organization's resources for education, 9) Competence and, 10) Communication. The managers reported that the nurses used team work and collaboration more often after participating in the e-learning continuing education course. They pointed out that the nurses got new tools for clinical practice related to the care of distressed and disturbed patients. The managers reported that a close observation nurse was used more than before. In addition, the managers had observed that the use of coercion seemed less than before the e-learning continuing education course. The nurses' use of coercion had likewise become more humane. Moreover, the nurses were more aware of their own work. The e-learning continuing education course made nurses more positively disposed towards development projects. The managers felt that organisation input into the e-learning continuing education course was seen as impact. Moreover, the nurses' competence was better after the e-learning course and communication among nurses increased. See Table 10. (Paper IV.)

Table 10. Summary of impacts from the managers' perspective (Paper IV).

Advantages	Co-operation Anticipation of aggression Overall difference in attitudes Acknowledge patient Awareness of one's own work New knowledge
Disadvantages	Time consuming Organisational resources
Implications	Team collaboration New tools for clinical practice Close observation nurse Reduction of isolation Humanity in coercion Nurses' awareness of their work Appreciation of development Organizations recourses to education Competence Communication

6. DISCUSSION

The aim of the dissertation was to evaluate on the basis of Kirkpatrick's four-level evaluation model an e-learning continuing education course intended for nurses working in the psychiatric field. As a theoretical approach Kirkpatrick's four-level evaluation model was used (Kirkpatrick 1996, Kirkpatrick & Kirkpatrick 2006). Four different phases were used to achieve this goal. This dissertation produced information on nurses' reactions, learning, behaviour and their implications based on their participation in the e-learning continuing education course. This knowledge was obtained by means of a systematic literature review, a randomised controlled trial among nurses, analysing nurses' written texts on the e-learning course and eliciting nursing managers' views on these four levels.

In this chapter the strengths and weaknesses of the dissertation are first discussed as regards validity and reliability but also trustworthiness. Second, the main findings are discussed in relation to the literature on the study area. Third, the implications of the study are discussed and fourth conclusions are drawn. Lastly, suggestions for future research areas are presented.

6.1 Validity and reliability

The adequacy of this doctoral research process was scrutinised by evaluating the validity and reliability of the study in different phases. The validity and reliability of the research design are discussed first (Grove et al. 2013). Mixed methods design was used in this study, and this has been shown to be beneficial for ensuring rich results and increasing the validity and reliability of the research (Casey & Murphy 2009, Bekhet & Zauszniewski 2012). Some limitations have likewise been conceded such as the incompatibility between the method chosen and the research question (Casey & Murphy 2009), and the actual use of mixed methods (Sandelowski 2000). In this study, to ensure that the data collected and results obtained would be rich and complete special attention was paid to the research question in every phase of the study (Bekhet & Zauszniewski 2012). Criticism has also been voiced regarding how mixed methods were used and if were researches able to show this (Casey & Murphy 2009). In this study using mixed methods was presented in detail in Table 4 to ensure that all components of mixed methods were transparent. However, it is also stated that using mixed methods can improve the validity and reliability of the research (Casey & Murphy 2009).

Validity and reliability have been discussed based on the papers of this study (Papers I, II ,III, IV). First, in paper I a systematic review was assessed based on Cochrane

guidelines for biases of included studies (Higgins & Green 2011) and second the quality of the review was assessed based on Cochrane guidelines and existing QUOROM guidelines (Moher et al. 1999). Second, in paper II an assessment was made based on Melnyk & Morrison-Breedy's (2012) checklist for randomised controlled trials. Third, in paper III an assessment was made based on Whittemore et al. (2001) of the contemporary synthesis of validity criteria in qualitative studies because it allows a more flexible approach to quality. Fourth, paper IV presented an assessment based on Tracy's (2010) criteria for qualitative research as it allows theory to show in rich rigour.

In Paper I, a systematic review and meta-analysis were reported. To assess the validity and reliability of the systematic review a twofold assessment was done. First, to assess the methodological quality of the studies included and second to assess the validity of the review. In this systematic review the validity of the studies included was confirmed using the RevMan program risk of bias table. Within this risk of bias table, six questions were asked and answered either as 1) Low risk of bias, 2) Unclear risk of bias, or 3) High risk of bias. The six questions were: 1) Random sequence generation, 2) Allocation concealment, 3) Blinding, 4) Incomplete outcome data, 5) Selective reporting and, 6) Other. This risk of bias table is presented in more detail in Figure 2 in Paper I. (Higgins & Green 2011.) Moreover, the methodological quality of the studies included varied. Although randomisation of the studies included was mentioned, a no detailed description of how the randomisation was done was presented. This raises the question if the randomisation was done appropriately in all the studies. On the other words, this may lower the validity of the results presented. Furthermore, the studies included in this review had rather small sample size and only two studies out of eleven presented adequate power calculations to have convenient sample sizes to be powered to show statistically significant results. The interventions in these eleven studies were quite heterogeneous and therefore the results presented can only be indicative. Further, the instruments used in these studies were only briefly described and this lowered the appraisal of the measurement tools in this review. (Paper I.)

Nevertheless, this systematic review has some strengths. A systematic approach was taken through out from searching the literature, screening and reviewing studies but also having a structured process for extracting data having standardized forms guided by the Cochrane Handbook for Intervention Studies (Higgins & Green 2011). Also, the search area was kept large enough to capture all possible studies in the scope of the inclusion criteria. It should nevertheless be born in mind that in spite of all possible effort to find relevant literature, the findings of this review could be deemed selective reporting by missing some relevant study. To ensure that the reporting of the systematic review was done appropriately the QUOROM statement checklist for reporting randomized controlled trials in systematic review was used (Moher et al. 1999). In addition a

PRISMA flow chart was used to illustrate the search process See more detail in Figure 1, Paper I (Moher et al. 2009). (Paper I.)

In Paper II, an intervention study with randomised controlled trial design was conducted. To assess the validity the focus was on internal and external validity (Melnyk & Morrison-Breedy 2012). Internal validity was checked using a checklist for eleven possible threats to internal validity: history, maturation, mortality, testing, instrumentation, regression to mean, selection, group contamination, compensatory intervention, resentful demoralisation, and statistical validity (Melnyk & Morrison-Breedy 2012).

First, history was assessed in means of what was happening during the study period. Overall discussion in society was raising the question of coercion and the need to diminish it (National Institute for Health and Welfare 2012) and this may have affected the internal validity of our study design so that in both groups (e-learning and education as usual) the nurses were acutely aware of a national need of reduce the use of coercion. Second, maturation as a threat means changes in the research participants themselves. During the study period the participants may have increased their abstract thinking in relation to the study themes because of the overall discussion of the importance of reducing the use of coercion and this may have affected the results. Third, mortality in terms of drop-out rates was assessed and it was found that within the e-learning group drop-out rates were lower than in the education as usual group and this may have affected the results so that people who tend to have a more positive view of the development of psychiatric care and reducing the use of coercion stayed. Fourth, testing at baseline and during follow-up may pose a threat to internal validity as participants remember the tests and answer the way they think researchers want to hear. However, in this study the follow-up time was three months and this may mean that the participants no longer remembered their original answers. Fifth, instrumentation was checked carefully and the reliability of seven different instruments was calculated to ensure that the instruments used were stable enough. This has been presented more detail in Table 1, Paper II. However, it must be kept in mind that all instruments measuring effectiveness, although valid and reliable, were originally developed for non-psychiatric settings. Because of a conspicuous lack of structured and used instruments for physical restraint and seclusion in psychiatry, the instruments used in this dissertation were simply adapted (with the developers' permission) for this dissertation. All instruments, except the Knowledge of Legislation and Job Satisfaction Scale were used for the first time in Finland and in a psychiatric setting. Sixth, regression to the mean refers that different people may score differently at baseline and during follow-up. In this study, to ensure that this threat would be minimal, randomisation was done to make sure that the groups were as much alike as possible so that extreme scores would be equally distributed within the intervention and the education as usual group. Seventh, selection may pose a threat to internal validity and in this study randomisation was done to ensure that selection was impartial. In

this study the baseline characteristics showed no statistical difference between groups indicating that both groups were equal, even though in the e-learning group had more registered nurses holding upper level qualifications and the education as usual group had more mental health nurses with lower level education. Eight, group contamination may lead to bias in internal validity and in this study we cannot ensure that no contamination occurred as the people in the study hospital interacted with each other. Moreover, the education as usual group received continuing education as normally offered on the wards. Ninth, compensatory intervention leads to a threat to internal validity as regards the education as usual group gaining and receiving information as compensation for not being an intervention group. In this study this may have occurred so that participants in the education as usual group participated more actively in the continuing education offered in the organisation, thereby affecting the results as some parts of the education as usual group scored better. See more detail in Table 3, Paper II. Moreover, after the study period the same e-learning education was offered to all nurses in the education as usual group. Tenth, resentful demoralization may pose a threat to internal validity and this means that the education as usual group feel neglected because they were not selected for the intervention group. In this study, to avoid any demoralization in the education as usual group normal continuing education was offered to them. Later the same e-learning course was offered to the education as usual group, too. Eleventh, statistical conclusions can cause some internal threat as regards lack of adequate power calculations and assumptions of statistical tests. In this study power calculation was done to ensure optimal sample sizes in intervention and education as usual group to yield statistically significant results. The assumptions from statistical tests were done with the help of statistician. (Paper II.)

The external validity of the research was assessed in light of four main threats to external validity (Melnyk & Morrison-Breedy 2012). First, recruiting a diverse study sample was goal in this study. Having three big study hospitals participating and twelve study wards randomised into intervention and education as usual groups ensured sufficient diversity for adequate generalization. However, this may also be too small a recruitment area as there are twenty hospital districts in Finland. Nevertheless, our study with two hospital districts covered a catchment area of over two million inhabitants (Association of Finnish Local and Regional Authorities 2013). Second, trial setting and selection of study centres can be one cause of external threat. In this study three big hospitals in two large hospital districts were selected so as to reflect the typical ward, patient and nurse settings in Finland. Third, measuring relevant clinical outcomes is important in avoiding any threat to external validity. The selection of outcomes should measure the most important anticipated effects of the intervention. In this study, seven outcome measurements were used and the instruments were valid and widely used. The reliability of the instruments was at a good level. However, most of the measurement instruments

used had not been developed for effectiveness studies and did not measure themes in the intervention the e-learning course in this study. Lastly, additional challenges to external validity were checked. In this study ethical dilemma was carefully considered as the intervention group participated in important education on topics related to coercion and the care of aggressive patients. Therefore the decision was made to allow the education as usual group to be offered continuing education as normal on the study wards although this may have led to study contamination. Moreover, the framework of the CONSORT statement was used and a flow chart of participants, see Figure 1, Paper II (Moher et al. 2001, Schulz et al. 2010). (Paper II.)

In Paper III, validity questions were considered as primary and secondary based on the suggestion by Whittemore et al. (2001) on how to evaluate the validity of qualitative studies. The primary validity criteria include credibility, authenticity, criticality and integrity. The secondary validity criteria include explicitness, vividness, creativity, thoroughness, congruence and sensitivity. Primary validity criteria are first assessed. Credibility refers to the idea that the results reflect the participants' experience in a meaningful way. In this study credibility was ensured in that participants' written texts were analysed inductively so that the participants' own views are expressed coded and categorised. Authenticity refers to participants' true experiences and freedom to express their thoughts without influence on the part of the researcher. In this study in one assignment the participants were free to write using their own words in the e-learning course platform. Criticality refers to systematic research design, which in the present case was descriptive. To be able to fully investigate the phenomena one quantitative question was also included and this strengthened the validity of criticality because all possible research designs were critically thought through. Integrity refers to the subjectivity of interpretative research and here it was ensured in such a way that one person did the coding of the data and other researcher verified the coding and categorising. (Paper III.)

The criteria of a secondary validity, explicitness, vividness, creativity, thoroughness, congruence, and sensitivity are additional principles ensuring the validity and quality of qualitative studies (Whittemote et al. 2001). Explicitness refers to the clear presentation of how data coding is done and how well the results are presented. In this study, clear coding and its presentations were illustrated in Table 1, see more detail in paper III. Moreover, original quotations bring vividness to the study results showing them to a reader as thick and faithful. Creativity means new insight in methodological design to answer the research question. In this study, a novel approach was to have descriptive design using the participants' written texts in the e-learning platform to answer the research question on knowledge transferability from the e-learning course to daily practice. Thoroughness in qualitative research refers to sampling and its comprehensiveness. In this study, sample size was rather small due the nature of participant recruitment. Participation in the e-learning course was voluntary and this also may raise bias as voluntarily participating

students may be more positively disposed towards this form of learning and therefore answer more positively than those who did not want to participate (Kisely and Kendall 2011). Congruence needs to be maintained throughout the whole study. In this study special care was taken to ensure congruence as qualitative methods were used with an effort to present the results in a meaningful way. Moreover, in reporting the criteria for qualitative data the COREQ checklist was used in this study (Tong et al. 2007). Nevertheless, because the study was conducted in one psychiatric hospital in southern Finland the results cannot be generalized (Paley 2005). Lastly, sensitivity means that ethical issues in design are considered and that the conduct of the research has been explicit. In this study the appropriate permission was obtained and all participants were asked to participate on a voluntary basis. (Paper III.)

In Paper IV, validity was assessed using Tracy's (2010) eight criteria as follows 1) worthy topic, 2) rich rigor, 3) sincerity, 4) credibility, 5) resonance, 6) significant contribution, 7) ethics, and 8) meaningful coherence. First, worthy topic refers to the relevance of the study, and how interesting it is, but also theoretically compelling. In this study, the topic was to introduce a novel approach to study nurses' reactions, learning, behaviour and impacts, and Kirkpatrick's theoretical approach was used for this. Second, rich rigour refers to sampling, data collection and analysis having a rich and thick understanding of complex phenomena. In this study rich rigour was assessed by having clear sampling; even though the sample size was ultimately rather small. Moreover, data collection took place electronically and therefore hopes were raised that busy nursing managers would have find time to answer the question. The data collection instrument was constructed on the basis of Kirkpatrick's theoretical model, ensuring rich rigour. Third, sincerity refers to transparency and in this study the researcher made every effort to show that the methodological process was as transparent as possible. The analysis process was confirmed by using representative quotations from the original text in the results and the analysis process is presented in Table 1, in Paper IV. Moreover, coding was done by one researcher but all the other researchers confirmed the coding process. Fourth, credibility refers to the trustworthiness, verisimilitude, and plausibility of the research results. In this study, credibility was ensured as the nursing managers were able to write their own expressions using their words so the results are based solely on participants' subjective perceptions. By having original quotations in results, thick description was ensured. Fifth, the resonance of transferability refers to generalizations regarding the potential value of the study results. In this study the sample was quite small and therefore may not be rich enough to represent psychiatric nursing managers across Finland even though participants were quite an informative group of respondents from psychiatric hospital organisations. Nevertheless, participation was voluntary and one reason for low response rate may be the highly demanding nature of nursing managers' work (Lee and Cummings, 2008) and that the time to answer is limited. Sixth, significant contribution

refers to how this study contributed to what is known about the phenomena researched. This study, as far as the authors were aware, the first to research nursing managers' views of nurses' reactions, learning, behaviour, and the impacts of one e-learning continuing education course. In this light the study made a contribution to the existing literature on this subject. Seventh, a good ethical approach was maintained throughout the study. Lastly, meaningful coherence means that did the study indeed achieve its goals and purpose. In this study the research questions were answered in a meaningful way and followed the theoretical approach selected. However, participation was voluntary and this may have given rise to bias as such people tend to answer more positively than those with more negative attitudes (Kisely and Kendall 2011). (Paper IV.)

6.2 Discussion of the results

6.2.1 Reactions to the e-learning course; nurses and nursing managers view

The results of this study confirm that nurses were satisfied with the e-learning course (Paper I). This result is based on a systematic review and qualitative analysis. To take an example, nurses and nursing students reported that they were more satisfied with e-learning because it seemed to be easy to use and they were willing to use it. The nurses and nursing students were satisfied with e-learning in preference to traditional learning methods. This finding is in line with the literature suggesting that health care professionals are satisfied with using e-learning in their education (Cobb 2004, Curran & Fleet 2005, Cook et al. 2008, 2010). This may also be because e-learning has been described to be easy, flexible and not fixed to any time and place (Schittek et al. 2001, Curran et al. 2010). Besides, our study showed that nurses would recommend the e-learning course to others (Paper III). This means that they felt positive enough towards e-learning so as to recommend it to others (Kirkpatrick & Kirkpatrick 2006). This is a similar finding to what Wallner et al. (2007), Wehrs et al. (2007) and Connolly et al. (2007) described in their studies, where the nurses were also willing to recommend e-learning courses to others.

Although the nurses were satisfied with the e-learning course this had no statistically significant effect on their job satisfaction (Paper II). The nurses' job satisfaction was studied in a randomised controlled trial and although job satisfaction did not improve, neither did it diminish. This finding is not completely supported by other studies as MacDonald and Walton (2007) studied turnover rates among health care professionals after participating in an e-learning course. They suggested that health care professionals' job satisfaction increased as the turnover rate decreased by over 20%. Yet turnover and job satisfaction are slightly different thing and perhaps cannot be compared in such a way. It may also be that the nurses in our study scored relatively high in the job

satisfaction survey overall (Paper II) even though the developers of the Job Diagnostic Survey (Hackman & Oldman 1974) made no assumptions about scores meaning better job satisfaction or worse job satisfaction. Although in their study the mean score was 4.1 with 658 participants (Prosser et al. 1996), in our study the nurses mean score in the e-learning group was 5.18 and in the education as usual group 5.23, suggesting relatively good job satisfaction.

The findings in our study suggest that from the nursing managers' perspective the nurses' reactions to the e-learning course showed positive, neutral and negative feelings (Paper IV). These findings are based on qualitative analysis of psychiatric hospital organisations' nursing managers' views on nurses' reactions to the e-learning course. Similar findings have been presented in the literature showing that an e-learning course can enhance students' feeling of self-efficacy and increase their satisfaction (Cook et al. 2008, 2010). These positive feelings described as encouraging as Kirkpatrick (1996) claims that to have a positive learning outcome from educational course the reactions to it need to be positive. On the other hand, in our study the nursing managers also reported some negative feelings from nurses regarding e-learning (Paper IV). This may be explained through earlier research indicating that nurses need enough time to be able to complete an e-learning course and one barrier is workload and lack of recourses (Bell & MacDougall 2013). This may be the case in our study even though the nurses were offered working hours to complete the course. Despite this, the research is indicates that home environment has been reported to be a more satisfactory place to run e-learning courses than the work environment because hospital ward settings may be hectic, and there may be a lack of time to find a moment to conduct e-learning courses (Cobb 2004). On the other hand, the nurses in our study may have felt that this e-learning course was mandatory due the fact that it was part of research and randomisation was on ward level, meaning that all those nurses working in one ward were assigned to this e-learning course. However, educating single groups e.g. participants with one discipline together (Mansouri & Lockyer 2007) thereby educating the whole team at the same time, which enables evidence-based practices to be transferred to clinical practice (Cleary et al. 2009).

6.2.2 Learning from the e-learning course; nurses and nursing managers view

This study finding suggest that nurses and nursing students had no statistically significant effect from the e-learning course in terms of increase of knowledge (Paper I). This result is based on a systematic review of nurses' and nursing students' knowledge increase after thee-learning course compared to that achieved in traditional learning. This finding replicates other reviews conducted on a similar topic (Cobb 2004, Wutoh et al. 2004), where e-learning was shown not to be superior to traditional teaching but not inferior either. Further, the results from this study show that nurses and nursing students had no statistically significant effect from the e-learning course in terms of skills enhancement

(Paper II). This result is contradictory to earlier research finding where Lu et al. (2009) found that participants in e-learning group had statistically significantly better outcome scores in skills enhancements. A systematic review by Wutoh et al. (2004) demonstrated that e-learning was better than traditional teaching for enhancing skills. But looking at reviews comparing e-learning to traditional teaching reveals no statistical difference (Cook et al. 2008).

The results from this study showed no statistically significant increase in what the nurses knew about the legislation on coercion physical restraint, or seclusion (Paper II). This was explored in a randomised controlled study design in psychiatric hospital settings. Yet the nurses in the e-learning group were seen to have statistically significantly better outcome scores ($p=0.036$) related to the legislation on coercion in the follow-up measures (Paper II). Moreover, nurses in both groups (e-learning and education as usual) had statistically significantly higher outcome scores in the within-group analysis related to knowledge of physical restraint (Paper II). This may be explained because the national goal and desire is to reduce the use of coercion by approximately 40% before 2015, in Finland (Ministry of Social Affairs and Health 2009) and nurses are aware of this agenda. But Janelli et al. (2006) also reported that nurses are balancing between legal and ethical issues when taking care of disturbed and distressed patients. It may also be that nurses find knowledge related to the law and coercive interventions important. This is significant, as Kirkpatrick (1996) points out that knowledge needs to be obtained from education for behaviour change to take place.

The results in this study show from the nursing managers' perspective that the nurses had gained knowledge during the e-learning course (Paper IV). This result is based on a qualitative analysis of psychiatric hospitals' nursing managers' views on nurses' knowledge after the e-learning course. The nursing managers mentioned that the nurses knew more about the law, ethical issues, treatment of aggressive patients and use of alternative methods. This is in line with earlier focusing on knowledge increase after e-learning courses (Cobb 2004, Wutoh et al. 2004, Lewis et al. 2005, Curran & Fleet 2005, Cook et al. 2008). Another issue raised by the nursing managers after the nurses had participated in the e-learning course was that discussion had increased. This finding is supported by earlier research by Wright et al. (2011) as they demonstrated that health care professionals benefit from continuing education by learning to communicate better with each other. Moreover, this is an important finding in from the organisational perspective (Bates 2004). As psychiatric organisations have given nurses opportunities to participate in e-learning courses partly during working hours it is meaningful for them to realise that they learned something after the course, but also to see that there is a trend to use more alternative methods to avoid coercive measures in practice.

In this study the findings suggest that e-learning had no statistically significant effect on nurses' attitudes to physical restraint (Paper II). This was studied using a randomised controlled trial in psychiatric hospital settings. Yet among the nurses in the education as usual group a statistically significant effect was observed related to attitudes toward seclusion (Paper II). This is partly supported by earlier research where nurses' attitudes changed during the education in the control group but not in the intervention group (Kulier et al. 2009). However, Kirkpatrick (1996) also claims that change in attitude may take some time to occur as it is difficult to determine the right time to measure the change. However, these findings favouring the education as usual group in our study may be explained by the consequent bias and noticeable shrinking of the education as usual group. In the other words, those participants who were more interested in the development of restrictive measures and relevant ethics were more likely to attend the follow-up session, while those with initially had less favourable attitudes towards restrictive measures might drop out more early.

The results in this study from nursing managers' perspective suggest that nurses experienced a change in attitudes after the e-learning course (Paper IV). This result is based on qualitative analysis of the psychiatric hospitals' nursing managers' views on nurses' attitudes after the e-learning course. Nursing managers, for example, reported that the nurses had changed their attitudes to patient care so that it had become more individualistic and collaborative. However, they also noted that the nurses were more positive about using alternative methods so that use of coercion was reduced from nursing managers' perspective. This finding from the nursing managers' perspective as to how they had observed the clinical practice after the e-learning course is important, as the national agenda in Finland is to reduce the use of coercion (Ministry of Social Affairs and Health 2009). It would be a promising result that the e-learning continuing education course on caring for aggressive patients had such an effect on nurses' attitudes.

6.2.3 Behaviour changes and implications resulting from the e-learning course; nurses and nursing managers view

In this study the findings suggest that the nurses were able to transfer knowledge from the e-learning course to daily practice (Paper III). This result is based on a qualitative analysis of the nurses' own written texts after the e-learning course. To take an example, the nurses stated that they were able to transfer knowledge from the e-learning course themes (law, ethical issues, external and internal factors, self-awareness, team work and integration of knowledge). The nurses also felt that they had been able to transfer understanding of preventive and alterative interventions to daily practice. This is in line with the earlier literature, where it has been shown that e-learning is an effective way of delivering knowledge and enables health care professionals to transfer knowledge to their clinical practice (Sears et al. 2008, Gruson et al. 2013). Kirkpatrick (1996) points out a need for a

positive reaction to education, for learning to take place and achieve a change in behaviour there must be some level of knowledge enhancement among students.

These study results show that from the nursing managers' perspective the nurses were able to transfer knowledge to clinical practice (Paper IV). This result is based on a qualitative analysis of psychiatric hospitals' nursing managers' views on nurses' knowledge transfer to practice after an e-learning course. Moreover, the nursing managers were able to identify similar changes in practice than the nurses themselves described in Paper III. The nursing managers reported that the nurses were able to transfer knowledge related to the anticipation of aggressive situations and use of alternative methods to reduce coercion. This finding is similar to earlier research findings where knowledge transfer was studied after an e-learning course and the effect was positive (Lewis et al. 2005, Sears et al. 2008). Yet in other study behaviour change was not stable over time and declined after some time had passed after the e-learning course (Wutoh et al. 2004). However, the e-learning course in this study was three months long, quite a long period of education, as health care professionals typically take continuing education in Finland three to ten days a year (Ministry of Social Affairs and Health 2004). This result in this study is still promising as both nurses and nursing managers reported that after the e-learning course knowledge was indeed transferred to daily practice. Using this kind of e-learning continuing education may be one solution to answer the national need to reduce the use of coercion in Finland (Ministry of Social Affairs and Health 2009).

The findings from this study suggest that the nurses had noticed several development factors related to their work in clinical practice after they had participated in the e-learning course (Paper III). This result is based on a qualitative analysis of the nurses' own written texts during the e-learning course. The nurses pointed out that they would develop, for example, their own work, the patient's role and the way the patient is treated, the use of alternative methods and environmental issues on the ward. The nurses mentioned having a named nurse and constant observation as one issue to develop in future. In addition, the nurses pointed out many issues related to patient handling, and the right to self-determination. This is an important result as coercive interventions encroach on human rights (Duxbury 2002, Kuosmanen 2009). Therefore more focus should be placed on how nurses handle patients. From the organisations' point of view this is also an important result as continuing education has been shown to produce better patient symptom handling (Covell 2009).

This study showed that the nursing managers hoped that the nurses could develop and transfer what they had learned to their work after they had participated in the e-learning course (Paper IV). This result is based on a qualitative analysis of psychiatric hospitals' nursing managers' views on nurses' development issues after the e-learning course. The nursing managers reported that in future they would like to see nurses using more

preventive and alternative methods to avoid aggressive situations on the wards and that the care of an aggressive patient could be based more on research. This is important as the Ministry of Social Affairs and Health (2009) has also stressed the overall need to develop mental health care nationwide and one priority area is to reduce the use of coercion. Moreover, the nursing managers hoped that in future the care of distressed and disturbed patients could be even more holistic, which is consonant with nurses mission in Finland, to take a holistic view of patient care (Finnish Nurses Association 2013).

This study showed that from the nursing managers' perspective there were advantages from this e-learning course (Paper IV). This result is based on a qualitative analysis of psychiatric hospitals' nursing managers' views on the impacts on practice of the e-learning course. The nursing managers pointed that the e-learning course was advantageous to clinical practice, for example, regarding the nurses' better anticipation of aggression. Moreover, the nursing managers pointed that the nurses' overall awareness of their own work and increased knowledge were among the advantages of this e-learning course. This is important as tailored needs based e-learning courses can improve health care professionals' knowledge and skills to obtain evidence-based knowledge (Leung et al. 2013). Yet the nursing managers reported disadvantages of thee-learning course (Paper IV). From the nursing managers' perspective the course was time consuming and the need for substitute nurses was a disadvantage. This finding is in line with the literature on the use of e-learning, where various barriers have been related to the use of e-learning (Maxwell & Mucklow 2012, Bell & MacDougall 2013). Bell and MacDougall (2013) reported similar results that students lack of time and resources were one impediment to the use of e-learning. However the nurses in this study were allowed to use some of their working hours to participate in the course.

The approach to investigating e-learning outcomes from an organisational perspective is a preferred (Kirkpatrick 1996, Kirkpatrick & Kirkpatrick 2006) but also a novel way of exploring what impact an e-learning course can have on to clinical work in the field of psychiatric nursing. The nursing managers also pointed that nurses' competence was improved after they had participated in the e-learning course. This is supported by the literature indicating that continuing education improves nurses' competence which is context related (Epstein & Hundert 2002) and especially in the field of mental health where there is need for competent nurses (WHO 2005). One important finding from this study was that the nursing managers reported one impact of this e-learning course to be humanity in coercion. This is a crucial finding as WHO (2005) points out that the use of coercive measures is a violation of psychiatric patients' self-determination. It is very promising that the e-learning course used in this study could influence the nurses' knowledge, attitudes and behaviour to such an extent that patients are treated more humanely in ethically difficult situations such as when there is a need to use measures which restrict the patient's freedom.

6.3 Implications of the study

Implications for nursing education

As use of e-learning has increased dramatically over the years and it is important to shift the focus to its implications for nurses' education and continuing education. It is important to ascertain when to use e-learning and when not. Education policymakers in health care and nursing are in a decisive role when deciding to use e-learning in the nursing curriculum in basic education and/or continuing education in nursing education. Health care educators need to focus on identifying the needs of learners related to the learning context in question when deciding whether to use this e-learning, blended learning or conventional method or a combination.

When deciding to use e-learning a wide range of different methods related to e-learning should be considered beforehand; level of interactivity, use of virtual patients or even the use of animations (Triola et al. 2012). No matter what e-learning method the educator decides to use it must be tailored to fit the learners' needs. There is an obvious need for well-tailored, needs based continuing education courses for psychiatric nurses. As an e-learning continuing education course can be one way to transfer knowledge to psychiatric nurses' daily work its increased use should be carefully considered in continuing education. Moreover, healthcare administrators can decide and plan future continuing education. However, we must keep in mind that the evidence is not yet strong due a lack of high quality research in this area.

Implications for clinical practice

The organisational perspective in this research has resulted in a new understanding of how nursing managers perceived the implications of the e-learning continuing education course. Given the shortage of nurses and the high turnover rates the competition for nurses has begun. Therefore one solution may be offering good, tailored and evidence-based continuing education courses to retain nurses in the field of mental health. Continuing education also enhances nurses' professional skills, which will also affect how they are retained in the profession. Moreover, the use of e-learning courses such as the course in this study is one way to improve nurses' knowledge and skills in mental health nursing. This may have a positive affection on patient care as it was observed in this study that the nurses were more aware of their work and applied what they had learned to patient care. As patient care in psychiatric hospitals is demanding and challenging the emphasis should be placed on those methods that will enhance nurses' competence to handle these challenging situations with distressed and disturbed patients.

Implications for research

According to this study focus on evaluative research related to the use of e-learning should pay more attention to a variety of outcomes rather than increasing satisfaction and knowledge. Using Kirkpatrick's evaluation model enabled the evaluation to focus on different levels such as reactions, learning, behaviour change and the final results of education. To highlight the need for well-designed evaluative research, proper samples and power calculations are needed to be able to show statistically significant outcomes in research among health care professionals and the use of e-learning. The process of randomization should also be conducted and reported in greater detail so that sufficient validity assessment is possible. In future the use of official statements like CONSORT and QUOROM should be taken seriously to help to r conduct and report research. Following these recommendations would clearly improve empirical research on the use of e-learning in nurses' continuing education by following a methodological protocol such as randomized controlled trials. Moreover, the QUOROM statement and the flow chart of the review help to produce better quality reviews and provide evidence based knowledge for the health care field.

6.4 Suggestions for future research

The need for research in the field of evaluating e-learning outcomes in mental health education will persist in the future. But there is also a need to explore further what kind of continuing education yield the greatest benefit to nurses and also patient health outcomes. The following research ideas and areas for future research have emerged from this study:

1. E-learning courses like the one in this study in the field of mental health and focusing on Kirkpatrick's evaluation model for outcomes such as cost effectiveness in continuing education, and patient health outcomes like coercion numbers are needed.

2. The long-term effects of e-learning courses like the one in this study should be investigated in the field of mental health nursing to be able to understand what knowledge is enduring and what e-learning course structures support this.

3. The process of knowledge transfer and issues affecting it, such as course tutors and students' learning processes need to be explored in more detail when using e-learning in the field of mental health.

4. The effects of the e-learning course should be evaluated from the patient's perspective so as to ascertain if such a course has effect on the patients as in this study has on psychiatric nursing.

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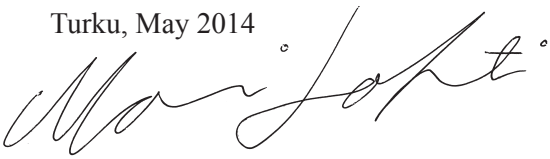

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