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NURSING STUDENTS' LEARNING ABOUT AN EMPOWERING DISCOURSE IN PATIENT EDUCATION

Heli Virtanen

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ABSTRACT

The main purpose of this study was to describe and evaluate nursing students' learning about an empowering discourse in patient education. In Phase 1, the purpose was to describe an empowering discourse between a nurse and a patient. In Phase 2, the purpose was first to create a computer simulation program of an empowering discourse based on the description, and second, the purpose was to evaluate nursing students' learning of how to conduct an empowering discourse using a computer simulation program. The ultimate goal was to strengthen the knowledge basis on empowering discourse and to develop nursing students' knowledge about how to conduct an empowering discourse for the development of patient education.

In Phase I, empowering discourse was described using a systematic literature review with a metasummary technique (n=15). Data were collected covering a period from January 1995 to October 2005. In Phase 2, the computer simulation program of empowering discourse was created based the description in 2006–2007. A descriptive comparative design was used to evaluate students' (n=69) process of learning empowering discourse using the computer simulation program and a pretest–post-test design without a control group was used to evaluate students' (n=43) outcomes of learning. Data were collected in 2007.

Empowering discourse was a structured process and it was possible to simulate and learned with the computer simulation program. According to students' knowledge, empowering discourse was an unstructured process. Process of learning empowering discourse using the computer simulation program was controlled by the students and it changed students' knowledge. The outcomes of learning empowering discourse appeared as changes of students' knowledge to more holistic and better-organized or only to more holistic or better-organized.

The study strengthened knowledge base of empowering discourse and developed students to more knowledgeable in empowering discourse.

Keywords: empowerment, patient education, nursing student, knowledge, simulation

Heli Virtanen
SAIRAANHOITAJAOPISKELIJOIDEN VOIMAVARAISTUMISTA TUKEVAN POTILASOHJAUKSEN OPPIMINEN
Turun yliopisto, Lääketieteellinen tiedekunta, Hoitotieteen laitos, Hoitotieteen tohtoriohjelma

Annales Universitatis Turkuensis, Medica – Odontologica, Painosalama Oy, Turku, 2015

TIIVISTELMÄ

Tämän mixed methods -tutkimuksen päätarkoituksena oli kuvata ja arvioida voimavaraistumista tukevan ohjauskeskustelun oppimista. Ensimmäisessä vaiheessa tarkoituksena oli kuvata hoitajan ja potilaan välistä voimavaraistumista tukevaa ohjauskeskustelua. Toisessa vaiheessa tarkoituksena oli kehittää tietokonesimulaatio-ohjelma tuotetun kuvauksen perusteella ja arvioida voimavaraistumista tukevan ohjauskeskustelun oppimista kehitetyllä ohjelmalla. Tutkimuksen tavoitteena oli vahvistaa voimavaraistumista tukevan ohjauskeskustelun tietoperustaa ja kehittää sairaanhoitajaopiskelijoiden tietoa ohjauskeskustelusta ja sen toteutuksesta potilasohjauksen kehittämiseksi.

Tutkimuksen ensimmäisessä vaiheessa kuvattiin voimavaraistumista tukevaa ohjauskeskustelua laatimalla metasummary-tekniikalla kirjallisuuskatsaus (n=15). Aineisto kerättiin ajalta 1995–2005. Toisessa vaiheessa kehitettiin tietokonesimulaatio-ohjelma tuotetun kuvauksen pohjalta. Opiskelijoiden (n=69) oppimisprosessia tietokonesimulaatio-ohjelmalla arvioitiin kuvailevalla ja vertailevalla tutkimusmenetelmällä. Oppimisohjelman avulla saatuja opiskelijoiden (n=43) oppimistuloksia arvioitiin esikokeellisella tutkimusmenetelmällä ilman kontrolliryhmää. Aineisto kerättiin vuonna 2007.

Tulokset osoittivat, että ohjauskeskustelu on kolmivaiheinen prosessi ja se on mahdollista simuloida sekä oppia tietokonesimulaatio-ohjelmalla. Oppimisprosessi tietokonesimulaatio-ohjelmalla oli opiskelijoiden kontrolloima ja se muutti opiskelijoiden tietoa. Oppimistulokset ilmenivät opiskelijoiden tiedon muutoksena holistisemmaksi ja jäsentyneemmäksi tai vain holistisemmaksi tai vain jäsentyneemmäksi kuin aikaisemmin. Opiskelijoiden tieto ohjauskeskustelusta vastasi osittain kirjallisuuden perusteella tuotettua kuvausta.

Tutkimus vahvisti voimavaraistumista tukevan ohjauskeskustelun tietoperustaa ja kehitti sairaanhoitajaopiskelijoiden tietoa ohjauskeskustelusta.

Avainsanat: voimavaraistuminen, potilasohjaus, sairaanhoitajaopiskelija, tieto, simulaatio

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I. Virtanen H, Leino-Kilpi S & Salanterä S. 2007. Empowering discourse in patient education. Patient Education and Counseling 66 (2), 140–146.

II. Virtanen H, Leino-Kilpi H, Leinonen K, Puukka P, Wöntsö J & Salanterä S. 2013. Nursing student control over using a computer simulation program about empowering discourse. CIN: Computers, Informatics, Nursing 31 (10), 512–522.

III. Virtanen H, Leino-Kilpi S & Salanterä S. Nursing students' knowledge about an empowering discourse: Pretest and posttest assessment. Collegian. Available online 17 July 2015, doi:10.1016/j.colegn. 2015. 06.004.

IV. Virtanen H, Leino-Kilpi S & Salanterä S. 2015. Learning about a patient-empowering discourse: testing the use of a computer simulation with nursing students. Journal of Nursing Education and Practice 5 (6), 15–24.

1. INTRODUCTION

Empowerment is one of the key issues in delivering high quality health care according to international (European Commission 2006, 2007, Health Consumer Powerhouse 2009, WHO 2013a, European Commission 2014, WHO 2015) and national health strategies (Ministry of Social Affairs and Health 2012, 2014). In the context of health care, empowerment means supporting patients in gaining control over decisions and actions affecting their health (WHO 1998), in two dimensions: individual and organizational (Kuokkanen & Leino-Kilpi 2000). The individual dimension is the target of this study, which focuses on patient empowerment. This study is part of patient empowerment research, which has a long tradition (Leino-Kilpi et al. 1998, 1999a, 1999b, Johansson 2006, Heikkinen 2011, Ryhänen 2012, Siekkinen 2014).

Patient empowerment is fundamental in health care (OECD 2010). The significance of patient empowerment is associated with health care practices with ambulatory services, progress in medical technology, reduction in hospital beds, short hospital stays (OECD 2014) and patients' self-determination in health care (Laki potilaan asemasta ja oikeuksista 785/1992, The Finnish Nurses Association 1996, ETENE 2001, Angelmar & Bergman 2007, ICN 2012). It is also necessary to support patient empowerment for practical reasons, since information is today more available than ever, making patients powerful but confused if they cannot use information effectively when it comes to their own health care (Chatzimarkakis 2010).

Patient empowerment is therefore a significant goal in the field of nursing and patient education. In nursing, patient empowerment has been widely discussed by researchers in recent years. Indeed, the concept of empowerment has been defined in various ways depending on its target group and context (Gibson 1991, Hokanson Hawks 1992, Rodwell 1996, Ellis-Stoll & Popkess-Vawter 1998, Ryles 1999, Finfgeld 2004, Hage & Lorensen 2005, Bradbury-Jones et al. 2008, Tengland 2008, Hermansson & Mårtensson 2010, Jerofke 2013, Fotoukian et al. 2014). In patient education, the central idea of patient empowerment is enabling patients to take responsibility of their health, to have the ability to make decisions about their own health and to participate in their own care (Wallerstein & Bernstein 1988, Funnel et al. 1991, Anderson et al. 1995, Anderson 1996, Aujoulat et al. 2007). However, patient empowerment cannot be given to patients, but only supported (Gibson 1991, Kuokkanen & Leino-Kilpi 2000, Crawford Shearer & Reed 2004, Funnell 2004, Hage-Lorensen 2005, Homan-Helenius 2005, Anderson & Funnel 2010, Heikkinen 2011).

An empowering discourse plays a central role in supporting patient empowerment. Conducting an empowering discourse is one method of empowering patient education,

aiming to support patient empowerment with knowledge (Leino-Kilpi et al. 1998, Rankinen et al. 2007, Heikkinen et al. 2011). However, knowledge alone is not enough to support patient empowerment (Dunn et al. 1990, Day 2000). Consequently, it is necessary to take into account how patient education should be implemented. Despite the growing use of health information technology and its positive outcomes in current patient education (Heikkinen et al. 2008, Heikkinen et al. 2011, 2012a, 2012b, Ryhänen et al. 2011, Ryhänen 2012, Ryhänen et al. 2012, 2013, Siekkinen 2014, Siekkinen et al. 2015a, 2015b), it is still important to develop face-to-face education for patient empowerment.

Due to the significance of an empowering discourse, it should be paid more attention in nursing education. Learning how to empower discourse is related to formal competence areas of nurses responsible for general care (European Commission 2005, ANA 2010, Hoving et al. 2010, Tuning project 2012, European Commission 2013). Thus, learning about empowering discourse can be seen as an aspect of nurses' interpersonal skills, teaching and supervising patients, their families, colleagues and nursing students. In Finland, nursing education can be conducted in polytechnics, based on an autonomous system regarding the construction and implementation of nursing curricula, and thus a wide variety of patient education studies are offered (Zabalegui et al. 2006, Ministry of Education 2012, Kajander-Unkuri et al. 2013, Ministry of Education and Culture 2014, Kajander-Unkuri 2015).

When learning about empowering discourse, scientific knowledge is prioritized as in current nursing education (Cannon & Boswell 2012) and professional nursing (Estabrooks 2009, ANA 2010). Scientific knowledge is needed to strengthen the knowledge basis for learning about empowering discourse, but also for the realization of an empowering discourse in patient education. There is a need to combine the findings of qualitative studies on empowering discourse in order to increase their use in empowering discourse education (Sandelowski et al. 1997, Sandelowski & Barroso 2003, Florczak 2013). Scientific knowledge on empowering discourse forms the basis for the process and outcomes of training student nurses in this skill.

The process of learning how to conduct an empowering discourse supports students' knowledge construction (Novak 2010, Biggs & Tang 2007). Earlier studies have proven computer simulation programs to be beneficial for the process of learning about various nursing interventions (Weis & Guyton-Simmons 1998, Jeffries 2000, Jeffries et al. 2003, Jeffries 2005a, Kiegaldie & White 2006, Durmaz et al. 2012). Specifically, computer simulation programs offer the opportunity for students to take control over the process of learning about empowering discourse. Furthermore, it has been stated that such computer simulation programs are useful because of their suitability for different types

of learners (Jeffries 2005b). Based on the previous educational science literature, the essential factors for describing types of learners are students' study orientations (Entwistle & Ramsden 1983, Lonka & Lindblom-Ylänne 1996, Mäkinen & Olkinuora 2004, Nieminen et al. 2004).

The outcomes of learning about empowering discourse, focusing on students' knowledge and its change, reflect what students know and understand at the end of the process of learning (Donnelly & Fitzmaurice 2005, European Parliament and Council 2008). Students' knowledge can be evaluated from a qualitative perspective focusing on their knowledge structure about an empowering discourse. Thus, concept mapping is used as an evaluation tool (Novak 2010).

The main purpose of this study was to describe and evaluate nursing students' learning about an empowering discourse in patient education. More specifically, the purpose was to describe an empowering discourse between a nurse and a patient, to create a computer simulation program of an empowering discourse based on the description, and finally, to evaluate nursing students' learning of how to conduct an empowering discourse using a computer simulation program. The ultimate goal was to strengthen the knowledge basis on empowering discourse and to develop nursing students' knowledge about how to conduct an empowering discourse for the development of patient education.

2. REVIEW OF THE LITERATURE

This literature review consists of two main parts. First, the main concepts are defined and second, previous studies on learning about an empowering discourse are explored.

2.1 Definition of main concepts of the study

Empowering discourse in patient education

In this study an empowering discourse is a complex and multifaceted method which is defined through its two components: empowerment and discourse. The concept of discourse is seen as a verbal interchange of ideas and formal extended expression of thought on a subject in the context of oral, face-to-face communication (Merriam-Webster 2014).

Empowerment can be defined in many different ways. Empowerment from a patient's perspective has been defined as the patient's mastery and resources, including seven dimensions: bio-physiological (e.g. knowing their own body, its biological changes and symptoms), functional (e.g. the function of their own body and mind), social (e.g. social interaction and contacts), experiential (e.g. earlier experiences and self-esteem), ethical (e.g. the feeling of being valued and respected), cognitive (having enough knowledge and the ability to use that knowledge) and financial dimensions (e.g. financial support) (Leino-Kilpi et al. 1998, 1999a, 1999b, 2005, Rankinen et al. 2007, Heikkinen et al. 2007, Heikkinen 2011, Ryhänen 2012).

In an empowering discourse, empowerment is seen as both a process and outcome, based on concept analyses on empowerment (Gibson 1991, Hokanson Hawks 1992, Rodwell 1996, Ellis-Stoll & Popkess-Vawter 1998, Ryles 1999, Finfgeld 2004, Hage & Lorensen 2005, Tengland 2008, Hermansson & Mårtensson 2010, Jerofke 2013, Fotoukian et al. 2014). Patient empowerment as a process is defined as an active learning process (Ellis-Stoll & Popkess-Vawter 1998) that supports patients in asserting control over their health (Gibson 1991), through personal growth and development (Feste & Anderson 1995, Funnell 2004, Kuokkanen & Leino-Kilpi 2000). Patient empowerment as an outcome is defined as a patient's ability to actively understand and control his or her own health (Funnel et al. 1991, Anderson et al. 1995, Leino-Kilpi et al. 1998, Pellino et al. 1998, Leino-Kilpi et al. 1999a, 1999b, Angelmar & Bergman 2007). The fundamental idea of empowerment, however, is that it cannot be given to others (Gibson 1991, Kuokkanen & Leino-Kilpi 2000, Crawford Shearer & Reed 2004, Funnell 2004, Homan-Helenius 2005, Hage-Lorensen 2005, Anderson & Funnel 2010, Heikkinen 2011), and therefore there is a great need to support patients in becoming empowered during an empowering discourse.

Moreover, the concept of an empowering discourse is closely connected to the concept of power, since both the concepts of empowerment (Gilbert 1995, Kuokkanen & Leino-Kilpi 2000, Kuokkanen et al. 2007, Bradbury-Jones et al. 2008) and discourse are interwoven with power (Fairclough 1996). Power is essential in an empowering discourse, as in all human interaction (Foucault 1978). It is evident in an empowering discourse that power manifests as a form of power with shared meaning between a nurse and a patient (Fairclough 1996), which is possible if nurses relinquish their professional power (Gibson 1991, Rodwell 1996). However, nurses themselves need to feel empowered in order to empower patients (Rodwell 1996). Therefore, it is important to support nurses' empowerment during their nursing education (Bradbury-Jones et al. 2007, 2010).

The concept of an empowering discourse has its roots in the Alma Ata declaration on Health for All beyond 2000 (WHO 1978) and Ottawa Charter for Health Promotion (WHO 1986), launched by the WHO to improve patients' rights and duties to participate in their health care and equal relations of power between health-care professionals and patients. Today, there is still a growing need for empowering discourse in nursing in order to strengthen preferable patient empowerment (European Commission 2006, 2007, Health Consumer Powerhouse 2009, WHO 2013b, European Commission 2014, WHO 2015).

An empowering discourse is an oral, face-to-face method between a nurse and a patient in empowering patient education. Empowering patient education has been the subject of research interest since the begin of the 1990s, both internationally (Anderson et al. 1991, Funnell et al. 1991, Davidson & Degner 1997, Pibernik-Okanovic et al. 2004, Keers et al. 2006, Keleher & Parker 2013) and nationally (Kettunen et al. 2002a, Pelkonen & Hakulinen 2002, Homan-Helenius 2005, Johansson 2006, Heikkinen 2011, Ryhänen 2012, Siekkinen 2014), focusing on various patient groups and methods. Empowering patient education is defined as an educational process including the identification of a patient's knowledge expectations (Funnell et al. 1991, Aujoulat et al. 2007, Johansson et al. 2007, Kääriäinen 2007), the setting of individual learning goals (Funnell et al. 1991, Aujoulat et al. 2007, Hermanns et al. 2013), the realization of learning activities, and the assessment of learning outcomes (Fee-Schroeder et al. 2013, Hermanns et al. 2013). One emphasis in empowering patient education is in the patient's cognitive processing and use of knowledge (Kuokkanen & Leino-Kilpi 2000). Therefore, a fundamental part of empowering patient education is knowledge. However, knowledge alone is not sufficient for patient empowerment (Dunn et al. 1990, Day 2000), as it is important to take into consideration how patients' knowledge construction is supported.

Learning

Learning is a widely used concept, and learning takes a wide range of forms depending on the theoretical approach. In this study, a constructivist approach is used. From a constructivist approach, learning is defined as an active constructive process of knowledge by a learner (Neisser 1982, Tynjälä 1999, Biggs & Tang 2007, Novak 2010). This implies that learners interpret new information based on their previous knowledge and experiences when striving to understand subject matter (Biggs & Tang 2007, Novak 2010). An essential part of learning is students' study orientations. Students' study orientations are defined as a combination of different features of learning (Entwistle & Ranmsden 1983, Nieminen et al. 2004) and personal meanings of that learning (Mäkinen 2003). Two common study orientations are 'meaning' and 'reproduction' orientations (Richardson 1997). The meaning orientation includes personal knowledge construction and self-regulation, while the reproduction orientation includes rote memorization and external regulation (Nieminen et al. 2004). Students' study orientations have also been described from the point of view of the level of a student's interest in studying (Lonka et al. 2004, Mäkinen et al. 2007, Murtonen et al. 2008), reflecting the student's capacity to actively and productively study (Murtonen et al. 2008).

In this study, the constructivist learning approach is combined with students' learning of an empowering discourse. The focus is on knowledge about an empowering discourse and how students construct this knowledge. Students' previous knowledge about an empowering discourse forms a starting point and students then have control over their knowledge construction (Biggs & Tang 2007). Students' knowledge is evaluated qualitatively, highlighting each individual's knowledge structure (Hay 2007). Next, knowledge about creating an empowering discourse learned in nursing and nursing education, and the process and outcomes of learning about an empowering discourse, are elaborated.

Knowledge about an empowering discourse forms the basis for the learning process and outcomes concerning conducting an empowering discourse. Scientific knowledge about empowering discourse in particular is essential because it specifies what knowledge we have about an empowering discourse and what knowledge is used for learning how to conduct an empowering discourse.

The process of learning about empowering discourse involves active knowledge construction (Biggs & Tang 2007, Novak 2010). Students have an active role in the learning process and they are encouraged to take control of their own learning (Biggs & Tang 2007). One method to facilitate the process of learning about an empowering discourse is a computer simulation program. Such a computer simulation program comprises an activity that aims to mimic some elements of a real empowering discourse

between a nurse and a patient, based on the idea of computer simulation programs (Ravert 2002, Jeffries et al. 2005). The use of a computer simulation program is justified by the multiple benefits for learning it provides. First, using a computer simulation program facilitates a balance between theoretical knowledge and real world experiences to support students' understanding of the subject matter (Jenson & Forsyth 2012). Second, it allows students to be active participants in their learning process (Rogers 2011). Finally, it promotes the development of students' understanding (Biggs 2003).

The learning outcomes concerning study about empowering discourse focus on students' knowledge and its change, reflecting what students know and understand at the end of the learning process (Donnelly & Fitzmaurice 2005, European Parliament and Council 2008). According to the constructivist learning approach, it is not important to find out how much learned knowledge a student can remember, but to find out what kind of qualitative changes are taking place in the student's knowledge (Tynjälä 1999, Biggs & Tang 2007). Furthermore, it is important to study students' knowledge since it represents one of the core nursing competencies (European Commission 2005, Marrow 2006, Salminen et al. 2010, European Commission 2011, Kajander-Unkuri et al. 2013, Finnish National Board of Education 2015, Kajander-Unkuri 2015).

In this study, the focus is on students' knowledge structures, indicating what knowledge students have about an empowering discourse and how their knowledge is structured in terms of the scientific knowledge concerning empowering discourse. This knowledge structure, also known as cognitive structure (Novak 2010) or structural knowledge (Jonassen et al. 1993), is described as a hypothetical construct representing the content areas and their relationships in the memory (Shavelson 1972, Koubek & Mountjoy 1991). An evaluation of knowledge structure can be conducted using a distinction between holistic and atomistic approaches (Marton & Säljö 2005, Svensson 2005) and the SOLO taxonomy (Biggs & Collis 1982). A holistic approach is connected to understanding the whole, whereas an atomistic approach is connected to learning detailed facts. (Marton & Säljö 2005, Svensson 2005.) In the case of an empowering discourse, a holistic approach concerns knowledge about the integrated whole structure of the discourse, including all of its phases. An atomistic approach concerns knowledge about the separate elements of the discourse, including limited phases. The SOLO (Structure of the Observed Learning Outcome) taxonomy includes five levels – pre-structural, unistructural, multi-structural, relational and extended abstract – associated with different cognitive complexities. The lowest levels (prestructural and unistructural SOLO levels) illustrate a poorly-organized knowledge structure, with separated content areas and no cross links. The highest levels (from multistructural to relational and extended abstract SOLO levels) illustrate a well-organized knowledge structure with possible cross links. (Biggs & Collis 1982.)

2.2 Previous studies on nursing students' learning about an empowering discourse in patient education

This part provides an overview of the previous studies concerning learning how to conduct empower discourse. First, the concept of empowering discourse in nursing and nursing education is explored, concerning what knowledge we have about an empowering discourse and what knowledge is used when students are learning about it. Second, the process of learning about empowering discourse is explored. Third, the focus turns to learning outcomes concerning empowering discourse. Finally, the theoretical background of this study is summarized.

2.2.1 Empowering discourse in nursing

Studies concerning empowering discourses were retrieved from the Ovid Medline and Pubmed (MEDLINE) databases in two parts. These databases were considered as relevant (Brazier & Begley 1996, Subirana et al. 2005, section 6.2.3). In the first part, search terms empowerment, power, resource, participation, facilitation, negotiation, communication, interaction, dialog, discourse, discussion, conversation and nurse–patient relations as MeSH-terms were used. Patient education was not used as a search term because it was too limiting. This search was conducted first for the years 1995–2005 (15 studies), and second for the years 2006–2015 (12 studies). The search was limited to English, empirical, qualitative studies concerning nurse–patient discourse, from an empowerment perspective, with patients who had a health problem, but did not have a psychiatric disorder, dementia or autism. The research report also had to have been published in an international refereed journal. In the second part, search terms nursing students, empowerment, power, teaching, learning and patient education were used. In addition, manual searches based on the reference list of the articles and hand searchers were conducted.

The concept empowering discourse was selected for this study. Earlier studies have used the concepts empowering relationship (Van Ryn & Heaney 1997, Aujoulat 2007), empowermental health counselling (Kettunen et al. 2001, Poskiparta et al. 2001, Kettunen et al. 2006), empowering dialogue (Tveiten & Meyer 2009, Tveiten & Knutsen 2011) and empowering interaction (Nygårdh et al. 2011) interchangeably. Furthermore, elements of an empowering discourse were found in studies focusing on nurse–patient discourse (Henderson 2003, Tutton 2005), patients' experiences of learning (Logan et al. 2008), communication (McCabe 2004, Tveiten & Severinsson 2006, Barrere 2007), encounter (Halldorsdottir & Hamrin 1997, Holmström et al. 2004, Nygårdh et al. 2011, Larson et al. 2012), interaction (Spiers 2002, Donohue 2003, Williams & Irudita 2004, Barrere 2007, Koeniger-Donohue 2007, Jangland et al. 2011, Zoffmann & Kirkevold 2012),

relationships (Kettunen et al. 2002b), accounts of practice (Funk et al. 2011) and support between a nurse and a patient (Alstveit et al. 2011).

An empowering discourse is characterized by the participants' roles and relationships and the characteristics of the discourse, but the structure of an empowering discourse is still somewhat unclear (I, Table 1). The structure of an empowering discourse has been seen to include initiation and progression phases, but rarely contains a conclusion phase. The studies have most often described a nurse–patient relationship (Halldorsdottir & Hamrin 1997, Lindahl & Sandman 1998, Falk-Rafael 2001, Kettunen et al. 2001, Mok 2001, Poskiparta et al. 2001, Kettunen et al. 2002b, Spiers 2002, Donohue 2003, Henderson 2003, McCabe 2004, Holmström et al. 2004, McCabe 2004, Tutton 2005, Williams & Irudita 2004, Logan et al. 2008, Funk et al 2011, Tveiten & Knutsen 2011, Larsson et al. 2012). Furthermore, the progression of an empowering discourse has been seen to be steered by nurses through various methods, such as support for participation (Otte 1996, Falk-Rafael 2001, Mok 2001, Henderson 2003, Tutton 2005), giving feedback (Kettunen et al. 2001, Poskiparta et al. 2001, Kettunen et. 2002b, Spiers 2002, Holmström et al. 2004) and reflection (Falk-Rafael 2001, Kettunen et al. 2001, Poskiparta et al. 2001, Spiers 2002, Tutton 2005).

Table 1. Studies on empowering discourse according to the literature 2006–2015

Elements	Author, year
A. Structure of empowering discourse	
1. Initiation of the discourse	
Creating atmosphere	Tveiten & Severinsson 2006, Barrere 2007, Koeniger-Donohue 2007, Logan et al. 2008, Alstveit et al. 2011, Funk et al. 2011, Nygårdh et al. 2011, Tveiten & Knutsen 2011
Shared negotiating	Funk et al. 2011, Nygårdh et al. 2011
2. Progression of the discourse	
Knowing patient as a starting point	Tveiten & Severinsson 2006, Barrere 2007, Alstveit et al. 2011, Funk et al. 2011, Jangland et al. 2011
Discourse steered by nurses through the use of various methods	Tveiten & Severinsson 2006, Barrere 2007, Koeniger-Donohue 2007, Alstveit et al. 2011, Funk et al. 2011, Jangland et al. 2011, Nygårdh et al. 2011, Zoffmann & Kirkevold 2012, Larsson et al. 2012
Content determined by patients	Tveiten & Severinsson 2006, Barrere 2007, Koeniger-Donohue 2007, Logan et al. 2008,
3. Conclusion of the discourse	Alstveit et al. 2011, Barrere 2007
B. Characteristics of empowering discourse	Tveiten & Meyer 2009
C. Participants' roles in empowering discourse	Tveiten & Severinsson 2006, Funk et al. 2011, Tveiten & Knutsen 2011
D. Nurse–patient relationship in an empowering discourse	Logan et al. 2008, Funk et al 2011, Tveiten & Knutsen 2011, Larsson et al. 2012,

It has been found that conducting an empowering discourse is difficult (Tveiten & Meyer 2009). Difficulties have resulted from contrasting objectives of care, discrepancies of knowledge and values (Tveiten & Meyer 2009, Tveiten & Knutsen 2011), paternalistic views of the participants' roles (Charalambous et al. 2008), unsuccessful involvement of patients (Barrere 2007, Tveiten & Meyer 2009) and a power imbalance between the nurse and the patient (Björk Brämberg et al. 2012). In addition, nurses have felt that they do not have sufficient competence in sharing power with patients (Tveiten & Meyer 2009, Tveiten & Severinsson 2006).

Therefore, it is important for nurses to already begin learning about how to conduct an empowering discourse in their nursing education. There is thus a need to refine the knowledge held about an empowering discourse, in order to effectively teach it. In earlier studies focusing on learning about patient education, learning related to an empowering discourse can be identified, but the knowledge base of the studies concerning empowering discourse has been incoherent. These studies have used various knowledge bases such as a self-efficacy theory (Goldenberg 2005), an expert role model (Little 2006), health promotion theories (Rash 2008) as well as philosophical and theoretical underpinnings of interpretative pedagogies (Scheckel & Hedrick-Erickson 2009) as a theoretical background. Furthermore, clinical patient education cases (Sandström 2006, Kaymakci et al. 2007), health literacy practices (Scheckel et al. 2010) and various written material including lecture material, scientific articles, handbooks and practical guidelines (Sensenig 2007) have been used.

2.2.2 Process of learning about an empowering discourse

Studies on the process of learning about an empowering discourse were retrieved from the databases Pubmed (MEDLINE) and Eric using the search terms empowerment, power, nursing student, teaching, learning, patient education, computer simulation, learner control, study orientation and learning orientation, in different search combinations. The searches were limited to English, empirical studies concerning nursing students' learning nurse–patient discourse from an empowerment perspective, computer simulation programs in nursing education, student control or learner control in learning, study or learning orientation. Furthermore, manual searches based on the reference list of the articles and hand searchers were conducted. The search was limited into English articles from the years 1995–2015.

The process of learning how to conduct an empowering discourse facilitates students' knowledge construction about an empowering discourse. However, there is a lack of previous studies on this process of learning. Instead, earlier studies have focused on the process of learning about areas related to empowering discourse. These studies have

used simulators, case studies, clinical learning and online learning methods to facilitate the process of students' learning. The simulations have included role-plays for practicing health teaching (Goldenberg 2005) and preparing students for the role of an educator (Little 2006), aimed to support students' self-efficacy (Goldenberg et al. 2005) and the development of students' personal knowledge (Little 2006). Furthermore, clinical learning (Kaymacki et al. 2007, Sensenig 2007, Choi et al. 2010, Scheckel et al. 2010), case studies (Sandström 2006) and online learning methods (Rash 2008, Scheckel & Hedrick-Erickson 2009) have been used.

In this study, a computer program simulating an empowering discourse is used as a facilitator for the process of learning how to conduct an empowering discourse. A computer simulation program is one form of simulation, with other forms including mannequins, live actors, human patient simulators, role playing, screen-based computer simulations, written scenarios and simulation games (Bearnson & Wiker 2005). The use of computer simulation programs in nursing education is increasing due to the development and generalization of educational technology. The computer simulation program, as a low-fidelity simulation, is suitable for learning about an empowering discourse, because generally they are used for training on a particular method (Cant & Cooper 2009).

A computer simulation program is seen to have potential for the process of learning how to conduct an empowering discourse. Earlier, computer simulation programs have been used in several nursing areas, including problem-solving skills (Rogers 2011, Smith et al. 2011), critical-thinking skills (Durmaz et al. 2012), medication administration (Jeffries 2000), diabetes care (Tatti & Lehmann 2001), cardiovascular skills (Weis & Guyton-Simmons 1998, Jeffries et al. 2003, 2011), critical care and skills (Weis & Guyton-Simmons 1998, Jeffries 2005, Tait et al. 2008, Botsis et al. 2011, Roh et al. 2013, Jenson et al. 2012) and the management of preoperative and postoperative care (Jeffries 2000). The computer simulation programs have been found to be beneficial in learning nursing interventions and to offer a safe learning method before encounters with real patients (Ravert 2002, Jeffries 2005b). However, the computer simulation programs have not previously been used for nurses learning about empowering discourse.

The use of a computer simulation program in the process of learning how to conduct an empowering discourse is seen as important since it facilitates student control over their learning (Kay 2001, Nokelainen 2006, Leacock & Nesbit 2007, Scheiter & Gerjets 2007, Winters et al. 2008, Fisher et al. 2010, Hadjerrouit 2010). Student control, also known as learner control, is essential in constructivist learning (EHEA 2012). The importance of student control is associated with the possibility for individuals to set their own learning objectives, progress at their own pace (Kay 2001) and to take charge of their own learning

process (Cust 1995, Winters et al. 2008). In addition, student control has been found to be essential when assessing the pedagogical usability of a novel multimedia learning method (Nokelainen 2006). However, research into student control when using computer simulation programs in nursing education is lacking, whereas technical usability, including the productive use of time (Jeffries 2005b), ease of navigation (Jeffries et al. 2003, Jeffries 2005a), flow and comprehensiveness of material (Jeffries 2005a), clarity of instructions (Jeffries et al. 2003) and technological access (Weis & Guyton-Simmons 1998) have been studied. In this study student control concerns students' learning objectives and work with the computer simulation program.

The use of a computer simulation program has been reported to be suitable for different types of learners (Jeffries 2005b), but there is a lack of research into students' study orientations in connection to using a computer simulation program in nursing education. Previous research on nursing students' study orientation is scant (Stiernborg et al. 1997, Snelgrove 2004).

2.2.3 Outcomes of learning about empowering discourse

Studies on the outcomes of learning about an empowering discourse were retrieved from the databases Pubmed (MEDLINE) and Eric using the search terms empowerment, power, nursing student, knowledge, knowledge structure, cognitive structure, structural knowledge, scheme, schema, schemata, mental model, SOLO taxonomy, concept mapping, evaluate, evaluation, assess, assessment, teaching, learning, patient education, study orientation and learning orientation, in various different combinations. The searches were limited to English, empirical studies concerning evaluation of nursing students' learning empowering discourse, evaluation of nursing students' learning using computer simulation programs, concept mapping as an evaluation method, students' knowledge and knowledge structures, SOLO taxonomy in evaluation of learning. Manual searches based on the reference list of the articles and hand searchers were also conducted.

There are few studies on the outcomes of learning how to conduct an empowering discourse. However, studies on learning outcomes related to an empowering discourse were identified (Table 2). The focus of these studies has been nursing students' knowledge, skills and attitudes. These studies have shown development in students' personal knowledge about the teaching process, including engaging with learners (Little 2006), construction of students' knowledge about the realization of patient education based on the patients' needs (Choi et al. 2010) and students' understanding about supporting patient empowerment (Sandström 2006, Rash 2008, Scheckel & Hedrick-Erickson 2009). In addition, some studies have addressed learning skills (Kaymakci et al. 2007, Sensenig

2007, Scheckel et al. 2010) and attitudes to patient education related to patient empowerment (Goldenberg et al. 2005, Little 2006, Sensenig 2007, Rash 2008, Scheckel & Hedrick-Erickson 2009, Choi et al. 2010, Scheckel et al. 2010). These previous studies have been descriptive, with small samples (n=7–79, Goldenberg et al. 2005, Little 2006, Kaymakci et al. 2007, Scheckel & Hedrick-Erickson 2009, Choi et al. 2010, Scheckel et al. 2010) or descriptions of educational innovations with no mention of sample size (Sandström 2006, Sensenig 2007, Rash 2008).

Table 2. Outcomes of learning related to empowering discourse according to previous studies

Outcomes of learning related to empowering discourse	Author, year
Knowledge related to empowering discourse	
Development of personal knowledge of the educator role	Little 2006
Understanding complexity of living with chronic diseases	Sandström 2006
Understanding using motivational interviewing	Rash 2008
Understanding using interpretative pedagogies	Scheckel & Hedrick-Erickson 2009
Effective knowledge building	Choi et al. 2010
Understanding of patient education process	Choi et al. 2010
Skills related to empowering discourse	
Communication skills	Kaymacki et al. 2007, Choi et al. 2010
Applying nursing process in patient teaching	Sensenig 2007
Therapeutic communication skills in interactions	Sensenig 2007
Teaching skills	Sensenig 2007
Learning to help patients understand	Scheckel et al. 2010
Learning to teach	Scheckel et al. 2010
Attitudes related to empowering discourse	
Increased self-efficacy related to health teaching	Goldenberg 2005
Developed confidence in the educator role	Little 2006
Developed competence as health educator	Little 2006
Appreciation of diverse patients	Sensenig 2007
Appreciation of motivational interview	Rash 2008
Meaning of applying interpretive pedagogies	Scheckel & Hedrick-Erickson 2009
Sense of professional accomplishment	Choi et al. 2010
Learning sensitivity	Scheckel et al. 2010
Meaning of persisting in teaching	Scheckel et al. 2010
Meaning of respecting languages	Scheckel et al. 2010

In this study, the outcomes of learning about an empowering discourse are related to the changes in students' knowledge. Knowledge is evaluated from the perspective of knowledge structure. A change in a knowledge structure has been shown to be an educationally sound way to provide information on the outcomes of learning (e.g. Novak & Gowin 1984, Shavelson et al. 2005, McLaughlin et al. 2007, Coderre et al. 2009,

Novak 2010). It is important to evaluate the changes in students' knowledge structures about empowering discourse, since it provides information on whether students have achieved sufficient knowledge and have coherent knowledge structures.

There is also a lack of previous study on the evaluation of nursing students' knowledge structures concerning empowering discourse, but some studies on nursing students' knowledge structures for other fields of nursing are available. Studies from as early as the late 1980s showed that nursing students' knowledge structures of nursing were poorly organized (Leino-Kilpi 1989). Recent studies have provided inconsistent results on the structure of students' knowledge. Students' knowledge structures for community health nursing have been quite narrow, with fewer connected relationships (Azzarello 2003), but also developed during a course (Azzarello 2007), whereas students' knowledge of science has been found to be quite well organized, even at the beginning of the studies, or it had become better organized during the studies (Petersson 2005). There is also a lack of research concentrating on students' knowledge structures with the use of a computer simulation. Instead, students' knowledge structures have been evaluated in other fields of educational research (Hay 2007, McLaughlin et al. 2007, Coderre et al. 2009, Ifenthaler et al. 2011).

This study applies the method of concept mapping as an evaluation tool. This evaluation tool has been executed in connection with a constructivist learning approach (Kinchin & Hay 2000). Concept mapping is a graphic organizational tool comprising concepts to identify specific content areas and the relationships between those concepts (Novak & Gowin 1984, Hay et al. 2008). Concept mapping has been proven to reveal what knowledge students have and how they have organized that knowledge (Novak & Gowin 1984, Kinchin & Hay 2000, Hay 2007, Hay et al. 2008). In nursing education, concept mapping has been used for teaching and learning, but rarely for evaluation. Concept mapping has not previously been used to evaluate the outcomes of students' learning about an empowering discourse.

Students' knowledge structures can be analysed using different theoretical backgrounds. Earlier studies have shown a distinction between holistic and atomistic knowledge (Svensson 2005), and that the SOLO taxonomy is appropriate for analysis in other fields of health-care education (Lucander et al. 2010, Prakash et al. 2010), but they have seldom been used in the evaluation of nursing students' knowledge structures. Leino-Kilpi (1989) has used these methods, resulting in atomistic and multi-structural knowledge in nursing students. The SOLO taxonomy has also been used in the evaluation of nursing students' performance in communication using creative arts (Emmanuel et al. 2010).

2.3 Summary of theoretical background

The theoretical background of this study is summarized in Figure 1 (Leino-Kilpi 1990, modified by Virtanen 2015).

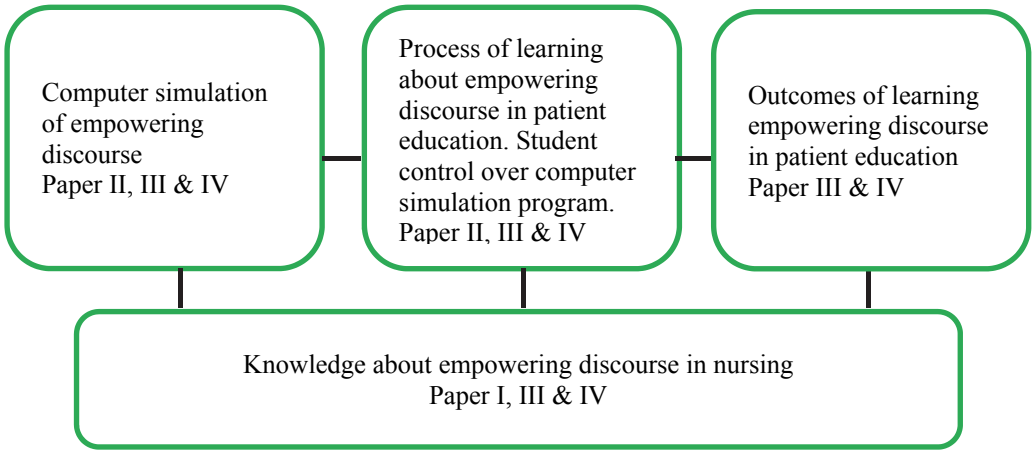


Figure 1. Summary of the theoretical background of the study (Leino-Kilpi 1990, modified by Virtanen 2015).

3. PURPOSE OF THE STUDY AND RESEARCH QUESTIONS

The main purpose of this study was to describe and evaluate nursing students' learning about an empowering discourse in patient education. In Phase 1, the purpose was to describe an empowering discourse between a nurse and a patient. In Phase 2, the purpose was first to create a computer simulation program of an empowering discourse based on the description, and second, the purpose was to evaluate nursing students' learning of how to conduct an empowering discourse using a computer simulation program. The ultimate goal was to strengthen the knowledge basis on empowering discourse and to develop nursing students' knowledge about how to conduct an empowering discourse for the development of patient education.

The detailed research questions were:

1. What is an empowering discourse in patient education?
   (I, II, III, IV and summary)
2. What is the process of learning about an empowering discourse for nursing students?
   (II, III and IV)
3. What are the outcomes of learning about an empowering discourse for nursing students?
   (III, IV and summary)

4. MATERIAL AND METHODS

This chapter presents the study design, settings and samplings, learning intervention, data collection, data analysis and ethical considerations for the two phases of the study (Phases 1 and 2). The research process is summarized in Table 3.

4.1 Design, settings and sampling

This study was a mixed methods study (Sandelowski 2000, Creswell 2009) in the setting of the existing literature concerning empowering discourse and Finnish nursing education in polytechnics, with a sample of qualitative studies and nursing students (Table 3). The mixed methods approach involved transforming qualitative data into a quantitative form (Johnson & Onwuegbuzie 2004, Creswell 2009, Sandelowski et al. 2009).

Phase 1 consisted of a systematic literature review using a metasummary technique. This systematic literature review (Sandelowski & Barroso 2003, Florczak 2013) was conducted in order to discover what an empowering discourse between a nurse and a patient contains (I). Patient education was not used as a search term, because it limited too much. For this review, the Ovid Medline database was searched, covering the period from January 1995 to October 2005. This database was considered relevant (Brazier & Begley 1996, Subirana et al. 2005, section 6.2.3). The literature search was targeted to qualitative studies (n = 15), since the area has scarcely been studied and since qualitative studies were prevalent in the area of empowering discourse studies. The studies were selected based on the following inclusion criteria: 1) the discourse was studied from an empowerment point of view, 2) the discourse was studied using a qualitative research design, 3) the discourse involved both a nurse and a patient, 4) the patients had a health problem, 5) the patients did not have a psychiatric disorder, dementia or autism, and 6) the research report was published in an international, refereed journal. The exclusion criteria were that: 1) there was no clear statement as to whether the discourse involved a patient and a nurse or a patient's relative and a nurse, and 2) it was unclear whether health professionals other than nurses were involved.

Table 3. Phases of the research and research questions

Phase and research question	Design	Setting	Sampling	Data collection	Outcomes	Analysis
Phase 1 2003–2007 What is an empowering discourse in patient education?	Systematic literature review using a metasummary technique	Existing literature on empowering discourse	Qualitative studies fulfilled inclusion criteria	Qualitative studies (n = 15)	Empowering discourse between a nurse and a patient	Content analysis, data synthesis, transformation of qualitative data into quantitative format, calculation of effect sizes
Phase 2, part I 2006–2007	Creation of a computer simulation program of empowering discourse					
Phase 2, part II 2007–2013 What is the process of learning about an empowering discourse for nursing students?	Descriptive comparative study	Nursing education in Finnish polytechnic	All eligible nursing students (n = 69) from six polytechnics	A feedback tool for the computer simulation program, A structured questionnaire for students' socio-demographic background, Shortened version of the Task Booklet of Learning, Inventory of General Study Orientations	Student control over computer simulation program, students sociodemografic background and study orientations	Content analysis, transformation of qualitative data into quantitative format, statistical analysis
Phase 2, part III 2007–2015 What are the outcomes of learning about an empowering discourse for nursing students?	Pretest–post-test design without a control group	Nursing education in Finnish polytechnic	All eligible nursing students (n = 43) from six polytechnics	A concept mapping method, A structured questionnaire for students' socio-demographic background, Shortened version of the Task Booklet of Learning, Inventory of General Study Orientations	Students' knowledge, knowledge structure and change of knowledge and knowledge structure, students sociodemografic background and study orientations	Content analysis, transformation of qualitative data into quantitative format, statistical analysis

The literature search was updated for this summary in 2015, through a search conducted in the database Pubmed (MEDLINE) covering the period from 2006 to July 2015 with same criteria. This new search yielded 12 qualitative studies, which confirmed the original search. Methodological characteristics and quality of the studies were evaluated concerning aims, designs, samples and data collection methods (I).

Phase 2 consisted of three parts: I) creating the computer simulation program of an empowering discourse (section 4.2), II) evaluating the process (II) and III) evaluating the outcomes (III and IV) of nursing students' learning about an empowering discourse.

In the second part of Phase 2, a descriptive comparative design was used when the process of learning about an empowering discourse was evaluated. In the third part of Phase 2, a pre-test–post-test design without a control group was used for evaluating the outcomes of learning about conducting an empowering discourse.

The data were the same for the second and third parts. The data were collected during a four month period in 2007 (from September to December) in six Finnish polytechnics. The initial objective was to collect data from eight randomly selected polytechnics out of 20 Finnish polytechnics so that each area of Finland, east, north, south, and west, would be represented by one polytechnic with more than 5000 students and another with less than 5000 students. However, there was an incompatibility between the data collection period and students' schedules, resulting in a total of six polytechnics. The eligibility criteria for the students were: 1) that they followed the nursing curriculum schedule, 2) they were not exchange students from outside Finland, and 3) they were not on maternity leave. In the second part of Phase 2, due to an unanticipated technical problem in the computer system, 32 students had to be excluded. In the third part of Phase 2, students who both used the computer simulation program and participated in pre- and post-testing were included. The response rate was 68% in second part (n = 69/101, II) and 62% in the third part of Phase 2 (n = 43/69, III and IV).

The students' mean age was 25 years, ranging from 21 to 48 years (second and third part of Phase 2). Almost all the students had experience of patient education in clinical practice and at a previous workplace (II). More detailed socio-demographic data for the students are shown in Table 4 and II, III and IV.

Table 4. Socio-demographic data for the students in the second and third part of Phase 2

Variables	Phase 2, part II n = 69 % (n)	Phase 2 part III n = 43 % (n)
Age, years		
21–23	60 (41)	70 (30)
24 ≤	40 (27)	30 (13)
Basic education		
Comprehensive school (9 years)	24 (16)	28 (12)
High school/college (12 years)	76 (52)	72 (31)
Prior professional education*		
No professional education	66 (45)	63 (27)
Vocational education	15 (10)	19 (8)
College/polytechnic education	18 (12)	16 (7)
University	1 (1)	2 (1)
Prior theoretical patient education studies		
First school year	51 (35)	N/A
Second school year	90 (62)	N/A
Third school year	86 (59)	N/A
Fourth school year	41 (28)	N/A
Prior patient education studies in clinical practice		
No studies in clinical practice	6 (4)	5 (2)
Some studies in clinical practice	94 (65)	95 (41)
Prior experience of patient education at work		
No experience	19 (13)	21 (9)
Some experience	81 (56)	79 (34)
Prior experience of patient education in clinical practice		
No experience	7 (5)	5 (2)
Experience in clinical practice	93 (64)	95 (41)
Prior information technology studies**		
One course	63 (42)	N/A
Several courses	37 (25)	N/A
Prior experience of computer learning programs**		
No experience	84 (58)	N/A
Experience in computer learning programs	16 (11)	N/A

* The sum more than 100%, ** N/A not available

In the second part of Phase 2, the students rated their patient education and information technology skills. Most of the students rated their patient education skills on average as 3.35 and information technology skills as 3.38 on a scale of 1–5 (II). In the second and third part of Phase 2, students' study orientations were assessed (Table 5). The students were grouped as either meaning-oriented or reproduction-oriented, and as being interested in studying or lacking interest in studying (II and IV).

Table 5. Students study orientations in the second and third part of Phase 2

Variables	**Phase 2, part II n = 69 mean (SD)**	**Phase 2, part III n = 43 mean (SD)**
Meaning-oriented learning		
Construction of knowledge	3.70 (0.66)	3.77 (0.61)
Self-regulation of learning	2.58 (0.90)	2.55 (0.92)
Reproduction-oriented learning		
Intake of knowledge	3.30 (0.87)	3.28 (0.79)
External regulation of learning	3.19 (0.76)	3.19 (0.79)
Lack of regulation	1.99 (0.84)	2.05 (0.83)
Conception of knowledge	3.54 (0.68)	3.50 (0.63)
Lack of interest	2.19 (0.70)	2.22 (0.78)

Scale from 1 (= low meaning orientation) to 5 (= high meaning orientation)

4.2 Learning intervention

A computer simulation program of an empowering discourse was created in the first part of Phase 2 and used as a learning intervention in the second and third parts of Phase 2 (II, III & IV, Figure 2). This was a novel intervention in nursing education for facilitating students learning how to support patients' empowerment in patient education. The creating and testing of this intervention in learning about an empowering discourse was supported by previous studies on learning about other nursing interventions using computer simulation programs (Weis & Guyton-Simmons 1998, Jeffries 2000, Tatti & Lehmann 2001, Jeffries et al. 2003, Jeffries 2005a, Botsis et al. 2011, Jeffries et al. 2011, Rogers 2011, Smith et al. 2011, Durmaz et al. 2012, Jenson & Forsyth 2012, Roh et al. 2013). In this study, the students used the computer simulation program through the Internet in the computer classes of their polytechnics during 90-minute sessions. Altogether, 11 sessions were carried out.

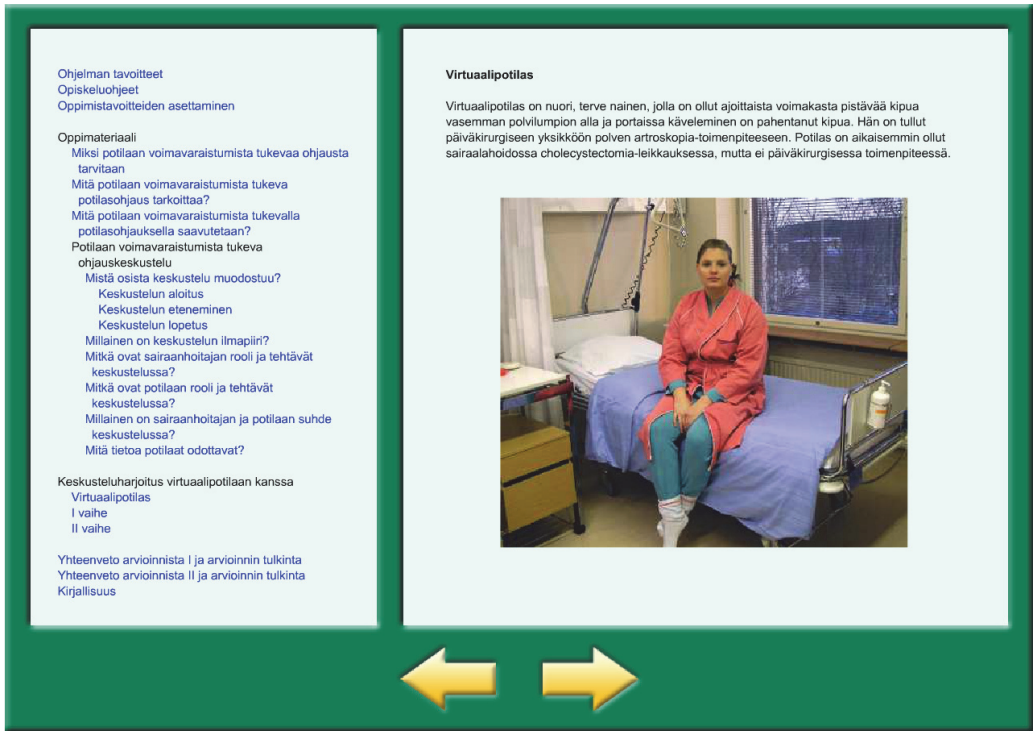


Figure 2. Layout of the computer simulation program (in Finnish)

The computer simulation program was an interactive multimedia program emphasizing the content and the method of learning about an empowering discourse. The content of the computer simulation program (Table 6) was created based on the systematic literature review conducted in Phase 1 (I) and previous studies on empowering patient education (Leino-Kilpi et al. 1998, Heikkinen et al. 2007, Rankinen et al. 2007). The computer simulation program included a simulated discourse between a nurse and a virtual patient, covering three phases (initiation, progression and conclusion, I) in six content areas of an empowering discourse (bio-physiological, functional, emotional, social, ethical and financial areas, Leino-Kilpi et al. 1998, Heikkinen et al. 2007, Rankinen et al. 2007).

As a method of learning about an empowering discourse, the computer simulation program was based on the constructivist approach (Neisser 1982, Tynjälä 1999, Biggs & Tang 2007, Novak 2010) including active knowledge construction (Biggs & Tang 2007, Novak 2010) and students' control of their own learning (Kay 2001, Nokelainen 2006, Biggs & Tang 2007, Leacock & Nesbit 2007, Scheiter & Gerjets 2007, Winters et al. 2008, Fisher et al. 2010, Hadjerrouit 2010). In the simulated discourse, the students had the possibility to select which phases and content areas they preferred to practice

(Kay 2001, Nokelainen 2006, Biggs & Tang 2007, Leacock & Nesbit 2007, Scheiter & Gerjets 2007, Winters et al. 2008, Fisher et al. 2010, Hadjerrouit 2010). Furthermore, the program included a learning objective, orientation and instruction pages.

Table 6. Content of the learning intervention

Objectives of the program
Instructions for using the program
Setting of learning objectives
Topics of written material

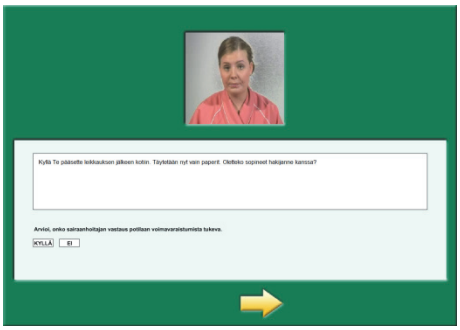
- Why is empowering patient education needed?
- What does empowering patient education mean?
- What is achieved with empowering patient education?
- Empowering discourse
- What is a structure of an empowering discourse?
- Initiation
- Progression
- Conclusion
- What is the atmosphere of an empowering discourse?
- What are the nurse's roles and tasks in an empowering discourse?
- What are the patient's roles and tasks in an empowering discourse?
- What is the relationship between a nurse and a patient in an empowering discourse?
- What knowledge do patients expect to gain?

Empowering discourse training

- Introduction of virtual patient
- Phase I (training with multiple-choice method) and Phase II (training with open-ended method)
    - Initiation phase of an empowering discourse
    - Progression phase of an empowering discourse
        - Bio-physiological issues
        - Functional issues
        - Social issues
        - Experiential issues
        - Ethical issues
        - Financial issues
    - Conclusion phase of an empowering discourse
- Feedback on multiple-choice method
- Feedback on open-ended method

References

Multiple-choice method



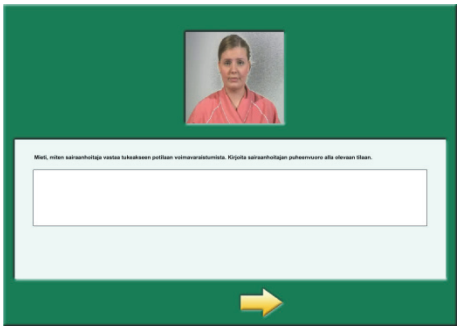
For example, the virtual patient said the following about her activities after the operation:
"An ambulatory operation is an easy way to get rid of my knee trouble and it's good that I will be able to lie down at home. It's nice to get an extra break,"

The student had the possibility to choose one of the nurse's responses, as follows:
"Right, I would like to hear how you think you will manage at home after the operation" (empowering response), or

"Right, I'll take care of the preparation of your operation. There is another nurse in an operating room that is waiting for you, but first, you need to go to the shower. Do you need information about washing and dressing before the operation?" (nurse-centred response), or

"Right! Let's complete the Surgery and Anaesthesia Form and I will shave you. You may not eat and drink before the operation, and after the operation, you will be told what happens next" (command-oriented response).

Open-ended method



For example, one comment by the patient about an ethical issue was, as follows:
"I have read about patient's rights and malpractice."

The student had the possibility to write a response, as follows:
"There is a patient ombudsman in the hospital. If you want further information, you can contact her."

Figure 3. Training methods of the learning intervention (Original publication II)

The computer simulation program offered two training methods: a multiple-choice method and an open-ended method (Figure 3). The methods were marked as phase I and phase II in the program (Figure 2). The students had the possibility to choose which method they preferred to use (Kay 2001, Nokelainen 2006, Biggs & Tang 2007, Leacock & Nesbit 2007, Scheiter & Gerjets 2007, Winters et al. 2008, Fisher et al. 2010, Hadjerrouit 2010). The multiple-choice method offered the nurses possible answers (overall 123) to the virtual patient (overall 41 questions or comments) from statements presented one by one, in random order, on the computer screen. In this method, the student's task was to evaluate the empowering effect of each answer on a dichotomous (yes or no) scale. The open-ended method offered the possibility to answer the virtual patient independently. In this open-ended method, the student's task was to write the nurse's answer to the virtual patient. When using the open-ended method, the student wrote the nurse's responses to the virtual patient. After the discourse, the students self-evaluated their responses on a dichotomous (correct or incorrect) scale or against model responses which had an empowering effect. The examples of the methods are presented in Figure 3.

4.3 Data collection

Data for this study were collected using different methods: a systematic literature search, an open-ended question, questionnaires for the students' socio-demographic factors and study orientations, a feedback tool for the computer simulation program and a concept mapping method.

In Phase 1 in 2005, data for describing an empowering discourse were collected through the systematic literature search in the Ovid Medline database covering the period from January 1995 to October 2005 (I). The search, using multiple search terms, provided 316 publications (I). After that, publications (n = 122) dealing with an empirical study and a nurse–patient discourse were selected. Finally, publications (n = 15) matching the inclusion criteria and exclusion criteria were selected for a metasummary. The systematic literature search was updated in 2015 covering the period 2006–2015.

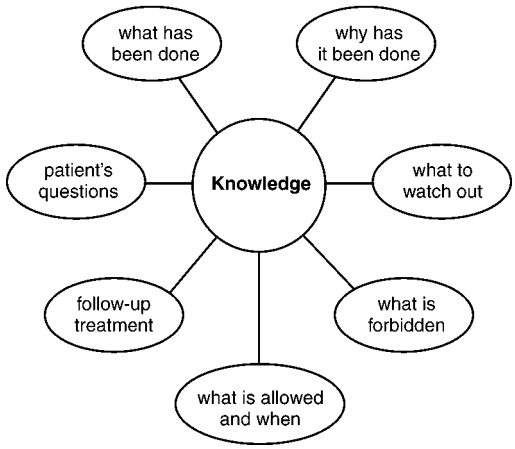
In Phase 2 in 2007, the data were collected with several methods for evaluating the process and outcomes of learning about empowering discourse (Table 7). In the second part of Phase 2, to evaluate the process of learning to empower discourse, data were collected using one open-ended question and a feedback tool for the computer simulation program. The open-ended question aimed to measure students' learning objectives before they began to use the computer simulation program.

In the third part of Phase 2, to evaluate the outcomes of learning about an empowering discourse, data were collected using concept mapping (Figure 4). Furthermore, in the second and third part of Phase 2, data on students' background variables were collected using questionnaires focusing on students' socio-demographic factors and study orientations.

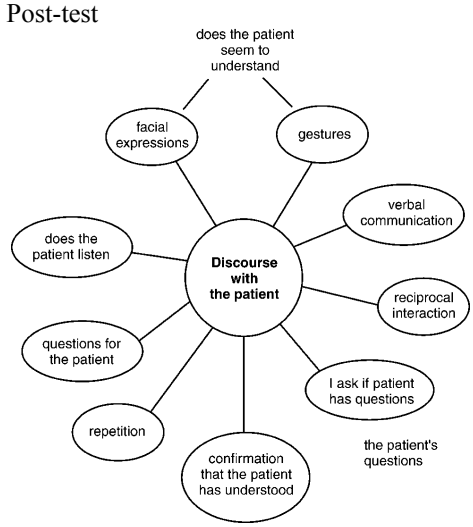
Table 7. Data collection methods in the second and third part of Phase 2

Method	Purpose	Subscale and number of items	Scale
Open-ended question	To measure learning objectives		
Feedback tool for computer simulation program	To measure students' learning with computer simulation program	Work with phases (3) Work with content areas (12)	Dichotomous scale (used, not used)
Concept mapping method	To measure students' knowledge and knowledge structure		
A questionnaire of socio-demographic factors	To measure students socio-demographic background	Age (1), basic education (1), prior vocational education (2) prior patient education studies (1), prior experience of patient education (1), experience of information technology study (1), prior use of computer simulation programs (1), patient education skill (1), information technology skill (1)	Open-ended and multiple-choice questions
Shortened version of the Task Booklet of Learning (Lonka & Lindblom-Ylänne 1996, Lindblom-Ylänne & Lonka 1999)	To measure study orientations	Meaning-orientation (9): construction of knowledge self-regulation of learning Reproduction-orientation (18:) intake of knowledge, external regulation, lack of regulation, conception of knowledge	Multiple-choice (1–5) second-tier
Inventory of General Study Orientations (Mäkinen & Olkinuora 2004)	To measure study orientation	Lack of interest (10)	Multiple-choice (range 1–5)

Pre-test

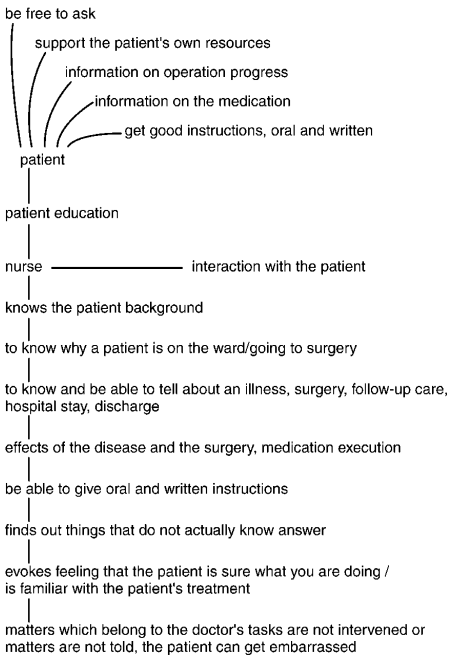


Post-test

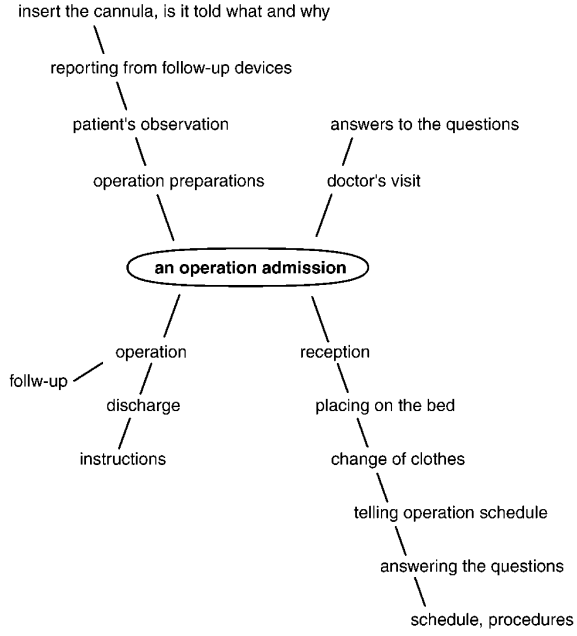


An example of a student's knowledge changing towards being more holistic.

Pre-test

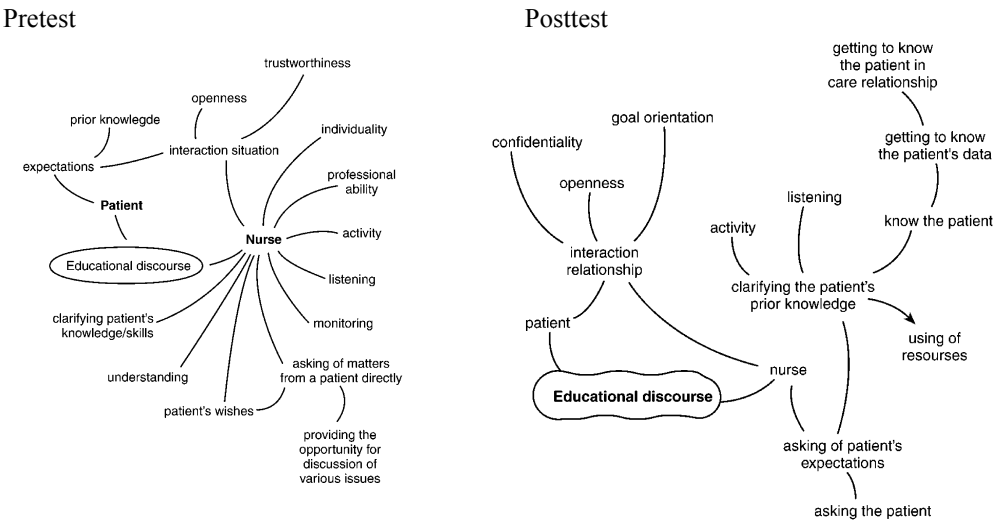


Post-test



An example of knowledge changing towards being more atomistic.

Continue to next page.



An example of knowledge remaining unchanged.

Figure 4. Examples of students' concept maps (Original publication III)

4.4 Data analysis

The analysis was conducted using different methods: content analyses, transforming qualitative data into a quantitative format and statistical analysis (Table 8).

In Phase 1, content analysis was used to determine the methodological characteristics of the selected studies (Miles & Hubermann 1994). This content analysis focused on the aims, designs, samples and data collection methods of the selected studies (n = 15). Data synthesis focused on data extraction (n = 357 statements), data reduction and inductive abstraction (n = 29) and the categorization of these findings. Transforming qualitative data into a quantitative format in Phase 1 was performed on the abstracted findings, through a metasummary technique (I, Sandelowski & Barroso 2003, 2005, Sandelowski et al. 2004, 2007). Statistical analysis was conducted to calculate the frequency and intensity of effect sizes (Onwuegbuzie 2003). The frequency of effect sizes was calculated for each of the 29 abstracted findings by dividing the number of reports containing a particular finding by the total number of reports. The intensity of effect sizes was calculated by dividing the number of abstracted findings contained within each study by the total number of findings.

Table 8. Analysis methods of the study

Analysis method	Research questions	Phase 1	Phase 2, part II	Phase 2 part III
Content analysis				
Purpose designed analysis	1	x		
Inductive analysis of students' learning objectives	3		x	
Deductive analysis based on distinction between holistic and atomistic	3			x
Deductive analysis based on SOLO classification	3			x
Comparison of content of knowledge	3			x
Comparison of structure of knowledge	3			x
Classification of change in knowledge content				
Classification of change in knowledge structure	3			x
Transforming qualitative data into quantitative format				
Quantification of abstracted findings	1	x		
Quantification of learning objectives	2		x	
Quantification of knowledge content categories	3			x
Quantification of knowledge structure categories	3			x
Quantification of SOLO levels	3			x
Quantification of changes in knowledge content	3			
Quantification of changes in knowledge structure	3			x
Statistical analysis				
Frequency effect sizes	1	x		
Intensity effect sizes	1	x		
k-cluster analysis (three cluster model)	2,3			
T-test	3		x	
Chi-square test	2,3		x	x
Fisher's Exact Test	2,3			x

In the second part of Phase 2, data analysis for evaluating the process of learning about an empowering discourse was conducted using several analysis methods. Inductive content analysis was conducted in order to determine the students' learning objectives. These learning objectives were categorized inductively into six groups. Transforming qualitative data into a quantitative format was performed in regard to these learning objectives. The transformation was made by counting the learning objectives in each group.

Statistical analysis was conducted using SAS release 9.1. First, descriptive statistical analysis for the students' background variables and the variables concerning students' work with the phases and content areas of the empowering discourse were performed. Three summative variables (meaning orientation, reproduction orientation and level of interest) representing students' study orientations were also formed. Second, the parametric and non-parametric tests were used to test differences in using the training methods and working with the computer simulation program. The paired T-test was used to test the differences from using the two training methods (multiple-choice and open-

ended). The Chi-square test was performed for examining the differences between socio-demographic factors and study orientations, and working with the computer simulation program. For testing differences between the meaning-oriented and reproduction-oriented students, a k-cluster analysis (three cluster model) was performed and extreme groups were formulated. Fisher's Exact Test was conducted to examine the differences between the level of interest in studying and working with the computer simulation program. For this, the summative variable of level of interest in studying was categorized into three groups, using tertiles. The first tertile represented students with the highest interest in studying and the last tertile represented students with the lowest interest in studying. These two extremes were used in further analysis. In all tests, $p<0.05$ was considered to be statistically significant.

The deductive content analysis (Miles & Hubermann 1994, Elo & Kyngäs 2008) was conducted in two parts, including a) an analysis of the content of knowledge and its change and b) an analysis of the structure of knowledge and its change. These analyses were conducted in three stages. In the first stage, an analysis of the content (III) and structure of knowledge (IV) was performed pre-test. A deductive content analysis was conducted based on the results of the systematic literature review (I), the approaches to learning (III, Marton & Säljö 2005, Svensson 2005) and a modified SOLO classification based on Biggs and Collis's (1982) classification (IV).

In the second stage, an analysis of the content (III) and structure of knowledge (IV) was performed post-test. These analyses were performed in the same way as the analyses in the first stage. In the third stage, an analysis of the changes in the content and structure of the students' knowledge were performed. The analysis of this change was performed by a comparison of the content and structure of the students' knowledge pre- and post-test, and the classification of this change into three groups. The groups regarding change in content were: change to be more holistic, no change, and change to be more atomistic (III). Similarly, the groups regarding change of structure were: change to become better organized, no change and to become more poorly organized (IV). These changes were quantified by counting the number of changes in each group.

Transforming qualitative data into a quantitative format was performed twice in the evaluation of the outcomes of learning. First, after the classification of students' knowledge structures, the SOLO levels were quantified by considering the SOLO levels as quantitative variables on an ordinal scale, as follows: prestructural=1, unistructural=2, multistructural=3, relational=4 and extended abstract=5. Second, the changes of the content and structure of students' knowledge were quantified by counting the number of changes in each group.

Statistical analysis was conducted using SAS release 9.1. The Pearson's Chi-square test or Fisher's exact test were conducted to test changes in the SOLO levels pre- and post-test. Descriptive statistical analyses for the students' background variables were performed. The summative variables of students' study orientations (meaning orientation, reproduction orientation and level of interest) were formed (II, IV). The Chi-square test or Fisher's exact test were used to evaluate the differences between changes in the students' knowledge structures and their socio-demographic factors and study orientations. P-values less than 0.05 were considered statistically significant. (Grove et al. 2013.)

4.5 Ethical considerations

The principles of research ethics were taken into account during the whole study (Medical Research Act 488/1999, Academy of Finland 2003, WMA Declaration of Helsinki 2004, Medical Research Act 794/2010, Burns & Grove 2009). Ethical considerations in this study concerned the research topic, permit processes, data collection and the research process as a whole.

The topic of this study was seen to be significant in the field of nursing science for three reasons. First, it was important to study how patient empowerment is supported in oral, face-to-face education, since supporting patient empowerment is one of the key objectives of international and national health policy statements (European Commission 2006, 2007, Health Consumer Powerhouse 2009, Ministry of Social Affairs and Health 2012, WHO 2013, European Commission 2014, Ministry of Social Affairs and Health 2014, WHO 2015). Second, patient empowerment and supporting that empowerment in oral, face-to-face patient education have rarely been studied in the field of nursing science. Last, study into how students learn to conduct an empowering discourse has been limited. However, it is evident that nursing education needs more research in order to educate more competent nurses about patient education. Based on the results of this study, suggestions can be made for how to support nursing students to become more knowledgeable about empowering discourse to develop patient education.

The permission processes concerned to carry out the research, to use data collection instruments and to use the computer simulation program. Preliminary ethical approval was not sought because participation in this study was not seen to cause injury to the nursing students (TENK 2009). However, preliminary ethical approval might have accelerated the reporting of the results. Permission to carry out this study was received from each of the six polytechnics. Permissions to use the modified instruments were received from the developers of the instruments (Vermunt 22.8.2006, Lonka &

Lindblom-Ylänne 23.8.2006, The Task Booklet of Learning adopted from the Inventory of Learning Styles and the Dualism scale; Olkinuora 3.10.2006, part of the Inventory of General Study Orientations (ten items)).

The permission to use the computer simulation program concerned the use of the program as a study intervention. The principal investigator was the owner of the computer simulation program and had the right to use the program. The woman who acted as a virtual patient in the computer simulation program gave written permission for her pictures to be used in the research reports. The students participated in using the computer simulation program with their ID code and a password to log in to the program via the Internet. The computer simulation program was not available openly on the Internet.

The data collection was conducted based on the ethical principles of research (TENK 2012). Participation in the study was voluntary (TENK 2012). Eligible students were informed about the study by their teachers in the polytechnics and in a study information letter. The students were free to decide whether to participate. The students' right to privacy in their studies was respected and no pressure on students to participate was exerted (Ferguson et al. 2006). Attendance at the computer simulation session and completion of the questionnaire, including the creation of a concept map, were taken as indications of voluntary participation. The students were informed that the information from the computer simulation program would be saved and used in this research. A number of students (n = 32) could not be included due to technical problems with the user platform of the University of Turku and data saving. The students were free to withdraw from the study at any point. Confidentiality and anonymity was ensured in all phases of the study (TENK 2012). The students were coded by number, which ensured matching the data in pre- and post-test in the third part of Phase 2. The data of every study phase were handled according to ethical principles of research (TENK 2009) and the results were reported openly and honestly (TENK 2012).

5. RESULTS

In Phase 1, an empowering discourse was described based on earlier studies (I). This description was updated in the summary. In the first part of Phase 2, an empowering discourse was created into the computer simulation program (II & summary). In the second part of Phase 2, the program was tested (II). In the third part of Phase 2, students' learning outcomes were evaluated (III & IV). The main results are reported in three parts according to the research questions (Figure 5).

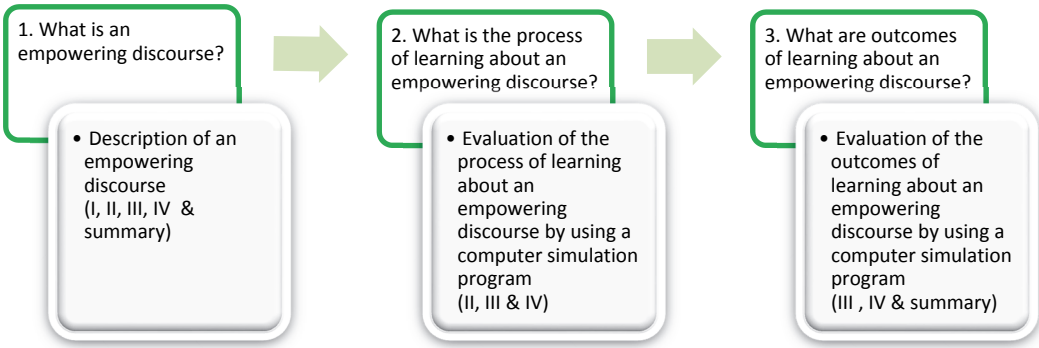


Figure 5. Research questions and structure of reporting

5.1 Description of an empowering discourse

In Phase 1, an empowering discourse was found to be a structured process including the characteristics of the discourse, roles and relationship of the participants (I & summary). The process of an empowering discourse included a structure covering an initiation and a progression phase (I). A clear conclusion phase was missing in previous studies, but it was added to the process of an empowering discourse based on researcher's educational competence and researchers' consensus decision due to its importance for increasing patients' awareness and understanding. The characteristics of the discourse were found to include discourse tone and length. It was found, that both of the participants had an essential role. The nurses' role was to enhance patients' competence. The patients' role was to participate in the discourse on an equal basis. The relationship was balanced and characterized by an appreciation of each other's expertise. The structure of an empowering discourse was combined with the characteristics of the discourse, roles and relationship of the participants for simulation of empowering discourse including the following elements: creating an appreciative atmosphere, negotiating the patient's discourse goal concerning their health problem, focusing on issues based on the patient's existing knowledge and knowledge expectations, supporting the patient's active participation in the discourse, and assessing the achievement of the discourse goal. The description of an empowering discourse is summarized in Table 9.

Table 9. Description of empowering discourse

Elements of empowering discourse
- A structured process including characteristics of the discourse, roles and relationship of the participants
1. Initiation
- Creating of appreciative atmosphere
- Negotiation concerning patient's health problem and discourse goal
2. Progression
- Focus on issues based on patient's existing knowledge and knowledge expectations
- Supporting patient's active participation in the discourse
3. Conclusion
- Assessing the achievement of the discourse goal

It was possible to simulate an empowering discourse in the computer simulation program (first part of Phase 2). The simulated empowering discourse between a nurse and a virtual female patient included all the phases (initiation, progression and conclusion, II, III, IV, summary section 4.2).

In the second part of Phase 2, it was found that it was possible to learn about an empowering discourse using the computer simulation program (II, III and IV). The students used all of the phases and content areas of the empowering discourse created in the computer simulation program. Regardless of socio-demographic factors and study orientations, all the students trained with all the phases and content areas of the empowering discourse (II).

In the third part of Phase 2, students' knowledge about an empowering discourse process was mainly fragmented (III & IV, Table 10, Table 11). At pre-test, the students' knowledge was mainly atomistic, including separated phases of an empowering discourse and only a few students' knowledge represented holistic knowledge including the whole process of an empowering discourse. At post-test, students' knowledge was mainly between atomistic and holistic knowledge, but over a quarter of the students had holistic knowledge (III).

Table 10. Content of students' knowledge about empowering discourse pre-test and post-test in the third part of Phase 2 (n=42)

Content of knowledge	**Pre-test** % (n)	**Post-test** % (n)
Holistic	12 (5)	29 (12)
Intervening	24 (10)	40 (17)
Atomistic	64 (27)	31 (13)

Pre- and post-test, the students' knowledge structure was prevalently multistructural including many single content areas within an empowering discourse with no cross links (IV, Table 11). In such cases, the students had knowledge about the initiation of the discourse, content of an empowering discourse, and supporting the patient's participation in the discourse. Only a few students' knowledge was well organized. These students' had knowledge of all content areas and some cross links describing the whole process of an empowering discourse and also some principles of nursing.

Table 11. Structure of students' knowledge about empowering discourse pre-test and post-test in the third part of Phase 2 (n=43)

Structure of knowledge	**Pre-test** % (n)	**Post-test** % (n)
Extended abstract	4 (2)	6 (3)
Relational	19 (8)	12 (5)
Multistructural	44 (19)	58 (25)
Unistructural	19 (8)	12 (5)
Prestructural	14 (6)	5 (12)

5.2 Process of learning about empowering discourse by using a computer simulation program

The process of learning about conducting an empowering discourse using a computer simulation program was evaluated in the second and third part of Phase 2. The process of learning was evaluated in terms of student control (II) and changes in the students' knowledge (III & IV). The main results are presented in Table 12.

In the second part, student control was evaluated based on the students' learning objectives and how they trained with the phases and the content areas of an empowering discourse. In addition, the process of learning about an empowering discourse was evaluated in connection to the students' socio-demographic factors and study orientations (II).

Table 12. Process of learning about an empowering discourse

Attributes of the process of learning about an empowering discourse
Controlled by the students (n = 69)
- learning objectives
- work with phases of an empowering discourse
- work with content areas of an empowering discourse
- choose training methods
Changed students' knowledge (n = 42)
- content of knowledge
- structure of knowledge

The process of learning about an empowering discourse was controlled by the students. Nearly half of the students set their own learning objectives for using the computer simulation program (n=34/69, 49%). The most common learning objectives were the desire to learn about patient education, to learn about empowering patient education as well as to learn about supporting patients' empowerment. Furthermore, the students aimed to practice the use of the computer simulation program, evaluate their patient education skills and understand patient empowerment.

The students (n=69) trained with all the phases (initiation, progression and conclusion) of the empowering discourse with a multiple-choice method (n=49–56, 71–81%), an open-ended method (n=35–38, 51–56%), and both training methods (n=24–35, 35–51%). The students most often trained with the progression phase. The students (n=69) trained with all the content areas (functional, social, ethical, bio-physiological and financial phases) of the empowering discourse with a multiple-choice method (n=19–42, 28–61%), an open-ended method (n=5–25, 7–36%), and both training methods (n=3–17, 4–25%). The students most often trained with the functional area and least often with the financial area. The students trained with the content areas more often with a multiple-choice method (mean 3.7, SD 2.5) than with an open-ended method (mean 2.0, SD 2.1, paired t test $p < 0.0001$).

The process of learning about empowering discourse varied in connection to the students' background factors and study orientations. The students who had not studied patient education during their first school year (n=25) trained with the content area concerning patients' daily functions (functional area) more often than students who had completed these studies during their first year (n=17, Chi-square test =4.51, p=0.034). The students who had not studied patient education in their last school year (n=30) trained with the content area concerning patients' daily functions more often than the students who had completed these studies during their last year (n=12, Chi-square test=6.42, p=0.013). The reproduction-oriented students (n=18) used the program more than the meaning-oriented students (n=19). The students who showed interest in studying (n=23) used the open-ended version of the program more often than those who were not interested in studying (n=21). Both groups, regardless of their interest in studying, used the multiple-choice method equally. However, there were no statistically significant differences between working with the computer simulation and students' study orientations.

In the third part, changes in students' knowledge were evaluated (III and IV). The process of learning about an empowering discourse changed both the content (III) and structure (IV) of the students' knowledge (Table 13). The changes were more evident in the content than in the structure of this knowledge.

Table 13. Changes in the students' knowledge (n=42)

	Change in knowledge		
	Improvement	Unchanged	Regression
Students' knowledge	% (n)	% (n)	% (n)
Content	48 (20)	48 (20)	4 (2)
Structure	19 (8)	63 (26)	19 (8)

5.3 Outcomes of learning by using a computer simulation program

The outcomes of learning using a computer simulation program were evaluated in the third part of the Phase 2 (III and IV, Table 14). Outcomes of learning were evaluated in terms of the changes of content and structure of the students' knowledge (III & IV). About half of the students (52%) achieved positive learning outcomes. These students' knowledge changed to be more holistic and better organized (14%), or to be more holistic (33%) or better organized (5%).

Table 14. Outcomes of learning about an empowering discourse (n=42)

Outcomes of learning	**% (n)**
Knowledge more holistic and better organized	14 (6)
Knowledge more holistic	33 (14)
Knowledge better organized	5 (2)
Knowledge more poorly organized	7 (3)
Knowledge more atomistic and poorly organized	5 (2)
No changes in knowledge	36 (15)

A change towards more holistic and better-organized knowledge was apparent for those students whose pre-test knowledge was atomistic (III) and unstructured with the lowest SOLO levels (IV). Post-test, around half of these students' knowledge did not change clearly into being holistic, but to knowledge in between atomistic and holistic (III). In addition, the students' knowledge changed to be multistructural, including separated content areas in a single or multiple hierarchy level or to an extended abstract level containing several content areas with some cross links.

Post-test, some students' knowledge also changed to be more poorly organized (IV, 7%) or to be more atomistic (III) and more poorly organized (IV, 5%). This change was seen in students whose knowledge was well organized pre-test. Post-test, these students' knowledge changed to be multi-structural with separated content areas without cross links. The knowledge of around one third of the students (III and IV, 36%) remained unchanged.

5.4 Summary of the main results

Based on this study, an empowering discourse was a structured process. It was possible to simulate an empowering discourse into the computer simulation program and learn with this program. The process of learning about an empowering discourse was controlled by the students. Students' knowledge changed to be more holistic and better-organized. However, students' knowledge was mainly fragmented. (Figure 6.)

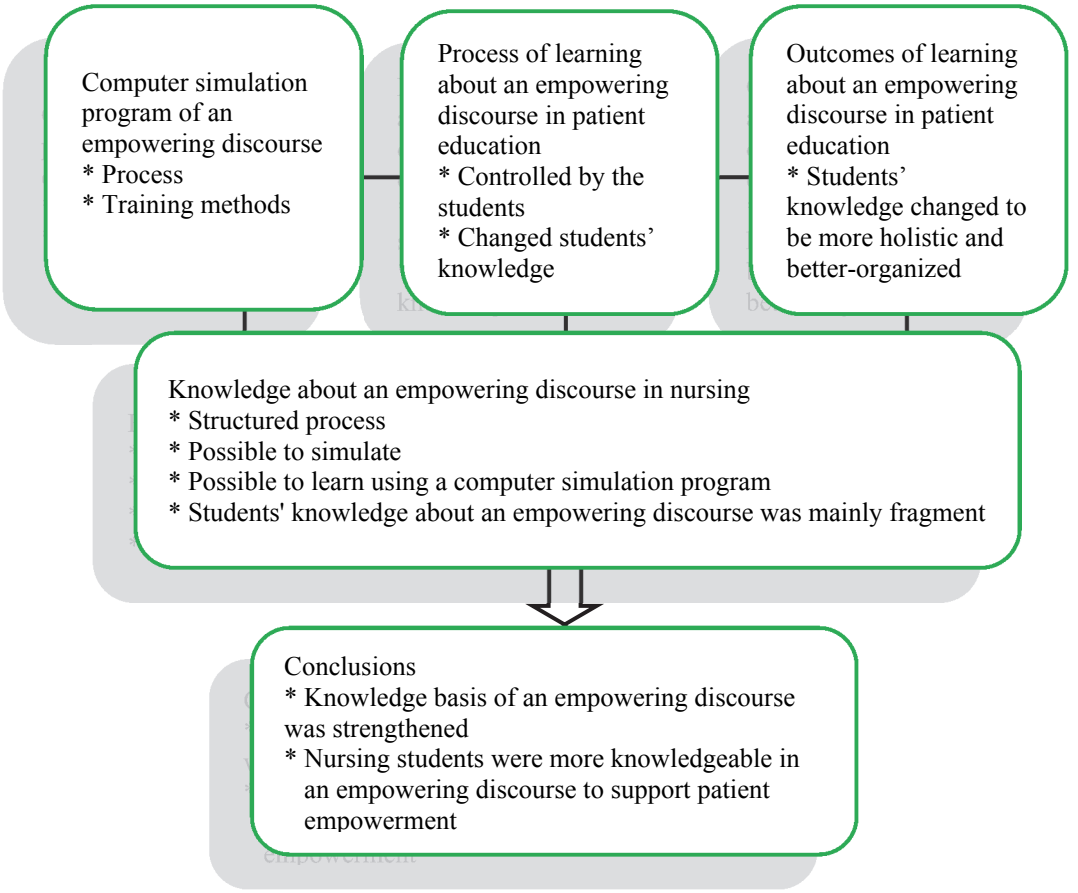


Figure 6. Summary of the main results

6. DISCUSSION

In this section, first the main findings are discussed. Second, validity and reliability of the study are in focus.

6.1 Discussion of the main findings

In this study, a new connection between empowering discourse and nursing students' learning was made. Learning how to conduct an empowering discourse was a study interest, because further evidence is needed to facilitate students' learning of how to support patient empowerment in patient education. This need for further evidence was clear, based on previous studies in the field of nursing education (Goldenberg et al. 2005, Little 2006, Sandström 2006, Kaymakci et al. 2007, Sensenig, 2007, Rash 2008; Scheckel & Hedrick-Erickson 2009, Choi et al. 2010; Scheckel et al. 2010). These studies revealed that learning how to conduct an empowering discourse has not been a main focus. Furthermore, clinical patient education studies have shown that patients are not empowered in regards to knowledge they have experienced receiving during patient education (Heikkinen et al. 2007, Rankinen et al. 2007). In light of these studies, this study aimed to describe an empowering discourse between a nurse and a patient, to create a computer simulation program of an empowering discourse based on the description, and to evaluate nursing students' learning of how to conduct an empowering discourse using a computer simulation program. Next, the main findings on empowering discourse, including the process and outcomes of learning about conducting an empowering discourse, are discussed.

This study expanded the knowledge base of empowering discourse from four perspectives: 1) a description of an empowering discourse, 2) the creation of the computer simulation program, 3) the process and 4) the outcomes of learning. First, the structured process of an empowering discourse was defined including an initiation, a progress and a conclusion phase. In addition, the results indicated that all of the phases of an empowering discourse were essential. In the context of previous research, the description of an empowering discourse was important since previous studies on empowering discourse (Halldorsdottir & Hamrin 1997, Kettunen et al. 2001, Poskiparta et al. 2001, Kettunen et al. 2002b, Spiers 2002, Donohue 2003, Henderson 2003, Holmström et al. 2004, McCabe 2004, Williams & Irudita 2004, Tutton 2005, Tveiten & Severinsson 2006, Tveiten & Meyer 2009, Alstveit et al. 2011, Funk et al. 2011, Jangland et al. 2011, Nygårdh et al. 2011, Tveiten & Knutsen 2011, Zoffmann & Kirkevold 2012) had described only the separated elements.

Second, this study provided the computer simulation program for learning how to conduct an empowering discourse. Based on the findings of previous research, scientific knowledge on empowering discourse (Halldorsdottir & Hamrin 1997, Kettunen et al. 2001, Poskiparta et al. 2001, Kettunen et al. 2002b, Spiers 2002, Donohue 2003, Henderson 2003, Holmström et al. 2004, McCabe 2004, Williams & Irudita 2004, Tutton 2005) and empowering patient education (Leino-Kilpi et al. 1998, Heikkinen et al. 2007, Rankinen et al. 2007) as well as knowledge on constructivism (Neisser 1976, Novak 1992, Tynjälä 1999, Biggs & Tang 2007) including active knowledge construction (Biggs & Tang 2007, Novak 2010) and students' control of their own learning (Kay 2001, Nokelainen 2006, Biggs & Tang 2007, Leacock & Nesbit 2007, Scheiter & Gerjets 2007, Winters et al. 2008, Fisher et al. 2010, Hadjerrouit 2010) were used in creation of the computer simulation program. Although computer simulation programs have been studied in nursing education (Weis & Guyton-Simmons 1998, Jeffries 2000, Tatti & Lehmann 2001, Ravert 2002, Jeffries et al. 2003, Jeffries 2005a, Kiegaldie & White 2006, Rogers 2011, Smith et al. 2011, Durmaz et al. 2012), previous studies have not focused on students learning how to conduct empowering discourse or learning about empowering patient education. Overall, the research into the use of computer simulation programs in nursing education is quite limited, whereas other simulations are amply studied, according to literature reviews (Kaakinen & Arwood 2009, Cant & Cooper 2010, Yuan et al. 2012, Fisher & King 2013, Oh et al. 2015).

Third, how to conduct an empowering discourse can be learned using the computer simulation program. This is an encouraging result, due to the significance of nurses learning about patient education in health care (WHO 2013, 2015, European Commission 2006, 2007, 2014, Health Consumer Powerhouse 2009, Ministry of Social Affairs and Health 2012, 2014). Earlier studies on supporting patient empowerment have shown that patients do not have enough knowledge for their self-management (Heikkinen et al. 2007, Rankinen et al. 2007). For that reason, it was important to develop learning strategies for nurses during their nursing education to help them support patient empowerment.

Last, the study findings revealed that the students' knowledge of an empowering discourse was unstructured, and seemingly fragmented. This is an important finding, since it might reveal insufficient understanding of an empowering discourse. Thus, compared to earlier studies (Little 2006, Sandström 2006, Rash 2008, Scheckel & Hedrick-Erickson 2009, Choi et al. 2010), this study effectively extended the information on nursing students' knowledge about empowering discourse.

The process of learning how to conduct empowering discourse using the computer simulation program was controlled by the students. This is important finding for new

multimedia learning methods (Nokelainen 2006). In addition, this study broadened the target of evaluation for computer simulation programs in nursing education. Previous studies have highlighted students' opportunities to choose (Weis & Guyton-Simmons 1998, Jeffries et al. 2003, Jeffries 2005a), but student control has been not evaluated.

The outcomes of learning about an empowering discourse using the computer simulation program were encouraging. The students' knowledge changed to be more holistic and better organized. This finding was significant since it had been shown that it is difficult to change atomistic knowledge into holistic knowledge (Svensson 2005). Accordingly, the change towards a more organized knowledge structure was important, especially in those students who initially had poorly organized knowledge structures. The study findings are in line with earlier studies using computer simulation programs. Previous studies have also shown some positive results in the outcomes of learning (Durmaz et al. 2012, Jeffries et al. 2003, Kiegaldie & White 2006, Botsis et al. 2011, Tatti & Lehmann 2001). Furthermore, the outcomes of learning about an empowering discourse can be seen as remarkable since prior clinical studies have shown a need for greater knowledge about supporting patient empowerment (Johansson et al. 2005, 2007, Nygårdh et al. 2011).

Moreover, this study provided a new perspective in terms of the students' study orientations, although the changes in the students' knowledge structures did not associate with the students' socio-demographic factors or with the students' study orientations. However, this result might indicate that computer simulation was useful in the process of learning about conducting an empowering discourse, regardless of the students' study orientations. Thus, our findings might indicate that the computer simulation program facilitated the process of learning the wholeness of an empowering discourse. However, some students' knowledge reminded unchanged or regressed, which might be due to lack of interest in creating concept maps or using the computer simulation program.

6.2 Validity and reliability of the study

The validity and reliability of this study are described from the perspective of the study design, setting and sampling, intervention, data collection, data analysis and the results of the study.

This study was a mixed-methods study. For the qualitative parts of the study, validity and reliability were evaluated by looking at the trustworthiness of the data collection and data analysis. In the quantitative parts, the validity and reliability were evaluated through the validity of the design, setting and sampling, validity and technical usability of the

learning intervention, validity and reliability of data collection, and the validity of the data analysis and results.

6.2.1 Validity and design, setting and sampling

This study was based on a systematic literature review, a descriptive comparative design and a pre-test-post-test design (Grove et al. 2013). In Phase 1, the systematic literature review was relevant because of the need to combine earlier study findings on empowering discourse in patient education. The selection of a metasummary technique for the systematic literature review was justified because of the qualitative nature of the studies (Sandelowski & Barroso 2003). This systematic review can be seen to strengthen the knowledge base concerning empowering discourse, but a synthesis of quantitative studies must also be integrated and incorporated in the future (Sandelowski & Barroso 2005). In the second part of Phase 2, a descriptive comparative design was used to evaluate the process of learning about an empowering discourse and the factors associated with it. This design was justified since with this method it was possible to describe and examine the differences between the students with different background factors. However, further evaluation is needed with a larger population (Grove et al. 2013). In the third part of Phase 2, the pre-test–post-test design was used without a control group to evaluate the outcomes of learning about an empowering discourse. The lack of a control group is a weakness, but this design has been proven to be appropriate when evaluating novel interventions (Cook & Campbell 1979, Bowen et al. 2009). However, the findings should be interpreted with caution due to the absence of a control group.

Both theoretical and empirical settings were used in this study. The combination of these two types of settings can be considered reasonable. In Phase 1, the theoretical setting made it possible to strengthen the knowledge base about empowering discourse (I). In the second and third part of Phase 2, the empirical setting was relevant for evaluating the process and outcomes of learning about an empowering discourse in Finnish polytechnics (II, III and III, Taylor et al. 2006). One weakness is that the evaluation was outside of the approved curriculum of the polytechnics, but the study was carried out in typical nursing schools.

The sampling of the study included a systematic literature search and randomized cluster sampling. In Phase 1, the systematic literature search was based on a strict search strategy, only resulting in articles which fulfilled the inclusion and exclusion criteria (n=15, I). The systematic literature search was updated to the period 2006–2015, which confirmed the findings. A literature search on the process and outcomes of learning about an empowering discourse was difficult to conduct due to the numerous literatures on a

constructivist learning approach. In the second and third part of Phase 2, the randomized cluster sampling was selected to cover polytechnics in the whole of Finland (II, III and III). The final number of the polytechnics was six, because the intended number was not possible due the students' time schedules. However, these polytechnics can be seen as representative because they were selected from all Finnish polytechnics using randomized cluster sampling. In addition, the polytechnics were selected from all geographical areas, so the number of polytechnics was satisfactory.

All graduating nursing students who fulfilled the criteria in the polytechnics (n=242) were eligible to this study, resulting in 101 participating students. This number is smaller than anticipated. In addition, technical problems in data collection decreased the number of students who participated. However, although the number of students was low (68%, II and 62%, III and IV), the response rates can be considered sufficient. The sample can be seen reasonable for this study considering the qualitative evaluation of the students' knowledge. Furthermore, the samples are representative, including typical graduating nursing students as compared to other Finnish nursing education studies (e.g. Suikkala et al. 2008, Lakanmaa et al. 2012).

6.2.2 Validity of the learning intervention

The validity of the learning intervention was evaluated from the perspective of content validity and technical usability. The theoretical background is associated with sound intervention. The content validity has been stated as essential for the intended results. (Conn et al. 2001.) Technical usability of the computer simulation program is essential for the process and outcomes of learning (Nokelainen 2006).

In the first part of Phase 2, the computer simulation program was created based on scientific knowledge on empowering discourse (Halldorsdottir & Hamrin 1997, Kettunen et al. 2001, Poskiparta et al. 2001, Kettunen et al. 2002b, Spiers 2002, Donohue 2003, Henderson 2003, Holmström et al. 2004, McCabe 2004, Williams & Irudita 2004, Tutton 2005) and empowering patient education (Leino-Kilpi et al. 1998, Heikkinen et al. 2007, Rankinen et al. 2007) as well as knowledge on constructivism (Neisser 1976, Novak 1992, Tynjälä 1999, Biggs 2007), active knowledge construction (Biggs & Tang 2007, Novak 2010) and student control (Kay 2001, Nokelainen 2006, Biggs & Tang 2007, Leacock & Nesbit 2007, Scheiter & Gerjets 2007, Winters et al. 2008, Fisher et al. 2010, Hadjerrouit 2010). Therefore, the theoretical background of the computer simulation program is justified. The creation of the computer simulation program was also supported by previous studies on students' learning about other nursing interventions using computer simulation programs (Weis & Guyton-Simmons 1998, Jeffries 2000, Tatti & Lehmann 2001, Jeffries et al. 2003, Jeffries 2005a).

The content validity of the computer simulation program was established based on the systematic literature review related to empowering discourse (I) and earlier studies on empowering patient education (Leino-Kilpi et al. 1998, Heikkinen et al. 2007, Rankinen et al. 2007). However, the simulated empowering discourse here was constructed by one researcher alone. The content of the computer simulation program was validated by a panel of two experts of empowering patient education and nine doctoral candidates in nursing science.

The technical usability of the computer simulation program including the functionality of the pages, user activities and the feedback system was validated by a panel of two experts in multimedia and DVD technology. The process of learning about an empowering discourse using the computer simulation program was pilot tested with five graduating nursing students (II). In this pilot test, the students used the program at their home through the Internet. The results showed that the students were able to use all the opportunities of the program and data were saved without problems into the researcher's email. However, the students would have preferred to have more technical support. Based on this pilot test, the computer simulation program was thus used in the polytechnics in this study. Furthermore, the researcher acted as a supervisor and technical support during the sessions in the polytechnics. Despite the validation and pilot test, there were unanticipated problems in data collection in the second part of Phase 2 (II). Therefore, it needs to be further examined how this risk can be minimized.

Furthermore, the computer simulation program was created and tested in 2007. This may set development needs of the program for corresponding technically today's educational technology. Also today's students may be more keen on participating in a study using educational technology and more active in using the computer simulation program.

6.2.3 Trustworthiness, validity and reliability of data collection

Different data collection methods were used both in the qualitative and quantitative parts of this study. The trustworthiness, validity and reliability of the data collection methods are discussed next.

In the qualitative part of the study, the trustworthiness of the systematic literature search, open-ended question and concept mapping methods was evaluated. In Phase 1, a systematic literature search was conducted on empowering discourse studies (I). The trustworthiness of the systematic literature search was ensured by selecting a relevant database and following the guidelines of the metasummary technique. The search was conducted in the Ovid Medline database. The selection of one database might be seen as too restricted, but it covered a large body of nursing studies (Brazier & Begley 1996,

Subirana et al. 2005). The search terms used were considered relevant to the concept of empowerment (Gibson 1991, Rodwell 1996, Ellis-Stoll & Popkess-Vawter 1998). The search terms did not include the concept of patient education, although this systematic review was conducted in the context of patient education. However, patient education as a search term was seen as too limiting. The number of the studies was small and inclusion and exclusion criteria were strictly followed. The inclusion and exclusion criteria seemed to be relevant for the technique used. In addition, the methodological quality of the selected studies was carefully evaluated. This may increase validity of the systematic literature review, because the studies without description of the research design were excluded. The studies were selected by one researcher, but under the supervision of two other researchers to increase trustworthiness.

In the second part of Phase 2, the trustworthiness of the open-ended question on students' learning objectives was evaluated (II). The open-ended question was a target specified method. It was seen as appropriate for the process of learning about empowering discourse using a computer simulation program emphasizing student control (Vandewatare & Clarebout 2011).

In the second and third part of Phase 2, the trustworthiness of the concept mapping method for the students' knowledge structures was ensured by confirming the students' familiarity with this method and evaluating the quality of the concept maps (III and IV). All of the participating students confirmed that they had drawn concept maps during their previous studies. However, further instruction before the drawings were completed might have improved the quality of the maps. The topic and instruction were the same both pre- and post-test, ensuring consistency between the tests. The quality of the concept maps can be seen to be limited. There was a lack of connecting phrases in the links between the concepts. This might be seen as a weakness of the concept mapping method. However, the concept maps illustrated students' knowledge on a hierarchical level, which is considered important for their knowledge structures (Novak & Gowin 1984).

In the quantitative part of the study, the validity and reliability of the feedback tool for the computer simulation program and questionnaires for students' socio-demographic factors and study orientations were evaluated. In the second part of Phase 2, an electronic feedback tool for the computer simulation program was used to evaluate the use of the computer simulation program. The content validity of the feedback tool was assessed based on the computer simulation program and its theoretical background. Although the feedback tool was developed for this study, it was seen as relevant for providing objective information about using the computer simulation program of an empowering discourse. Furthermore, the accuracy of the feedback tool was assessed in the pilot test

and with the empirical data. There were problems in the automatic data saving of the empirical data. Therefore, the feedback tool cannot be seen as completely accurate, but demanding further testing.

In the second and third parts of Phase 2, students' background variables were collected with structured questionnaires. Students' socio-demographic factors were collected with the questionnaire developed for this study. The content validity of the questionnaire was ensured based on the relevancy of the factors in learning about an empowering discourse with the computer simulation program. Students' study orientations were collected with two previously developed measurements: the shortened version of the Task Booklet of Learning (Lonka & Lindblom-Ylänne 1996, Lindblom-Ylänne & Lonka 1999) and one summative variable of the Inventory of General Study Orientations (Mäkinen 2003). The shortened version of the Task Booklet of Learning was adapted from the Inventory of Learning Styles (Vermunt & van Rijswijk 1998) and the scale of dualism (Perry 1968, Ryan 1984). The summative variable 'lack of interest' was one part of the Inventory of General Study Orientations (Mäkinen 2003, Mäkinen & Olkinuora 2004, Mäkinen et al. 2007). Both of the instruments have been used and tested previously in the field of educational sciences.

The reliability of the instruments used in this study was computed with Cronbach's alpha testing of the internal consistency of the instruments (Burns & Grove 2009). In the second part of Phase 2, the Cronbach's alpha scores for the summative variables of the Task Booklet of Learning were: construction of knowledge 0.59, self-regulation 0.76, intake of knowledge 0.77, external regulation 0.61, lack of regulation 0.78 and conception of knowledge 0.41. The Cronbach's alpha score for the summative variable of the lack of interest was 0.80. Some of the variables showed low consistency (> 0.70, DeVon et al. 2007, Grove et al. 2013). However, the instruments used were seen relevant to measure students' study orientations concerning meaning orientation, reproduction orientation (Nieminen et al. 2004) and the level of a student's interest in studying (Lonka et al. 2004, Mäkinen et al. 2007, Murtonen et al. 2008) in connection to the process and outcomes of students' learning.

6.2.4 Trustworthiness and validity of the data analysis

Different data analysis methods were used for the qualitative and quantitative parts of this study. Data transformation from qualitative to quantitative data was thus essential. The trustworthiness and validity of the data analysis methods are discussed next.

In the qualitative part of the study, the trustworthiness of content analysis was assessed. In Phase 1, deductive content analysis was conducted for the analysis of qualitative

studies on empowering discourse. Trustworthiness was ensured using the definitions of empowerment as a theoretical background (Gibson 1991, Rodwell 1996). In addition, the statements describing an empowering discourse were inductively reduced to a summarized description. Furthermore, the data transformation into a quantitative form made it possible to calculate frequency effect sizes for each abstracted finding and intensity effect sizes for each reviewed study, enhancing the trustworthiness of the analysis. The analysis was verified and agreed upon by three researchers.

In the second part of Phase 2, inductive content analysis was conducted to analyse the students' learning objectives. The inductive content analysis was considered relevant for describing individual learning objectives. Quantification of the objectives was appropriate to support the evaluation of the process of learning about an empowering discourse. The analysis was verified by two researchers.

In the third part of Phase 2, the students' knowledge was analysed using deductive content analysis. The selection of this analysis was seen as appropriate, since the theoretical background provided a systematic basis for the evaluation (Hsieh & Shannon 2005). The deductive content analysis was guided by the metasummary created in Phase 1 (I), approaches to learning (Marton & Säljö 2005, Svensson 2005) and the modified SOLO taxonomy, providing greater information on students' learning outcomes. Quantitative evaluation might have provided information on the amount of knowledge the students had, but this was not considered relevant for a constructivist learning approach.

The trustworthiness of the analysis of the students' knowledge was examined from the perspective of credibility, dependability and transferability. Credibility referred to having confidence that the data and analysis address the intended focus of the study (49). The credibility was supported by consistency in the concept mapping data, its analysis and the constructivist learning approach. The use of the metasummary created in Phase 1 increased the credibility of the analysis of students' knowledge. Although content analysis is to some extent subjective, rigorous scientific procedures were followed in order to support trustworthiness (Whittemore et al. 2001) and reproducibility (Moretti et al. 2011).

The use of the distinction between holistic and atomistic knowledge (III, Marton & Säljö 2005, Svensson 2005) and the SOLO taxonomy (IV, Biggs & Collis 1982) strengthened the qualitative evaluation of the students' knowledge. However, both analysis frames were modified, which might be a weakness. The distinction between holistic and atomistic knowledge was modified based on the students' knowledge by adding an extra category in between holistic and atomistic knowledge (III, Marton & Säljö 2005,

Svensson 2005). This could decrease credibility, but it produced more accurate results. The SOLO taxonomy was modified for this study based on the original taxonomy (Biggs & Collis 1982). This could decrease credibility. However, the SOLO taxonomy was followed strictly. On the other hand, the SOLO taxonomy might produce weak findings since each of the concept maps with two main concepts were automatically classified as poorly structured knowledge. To strengthen credibility, the researcher (HV) along with five other researchers evaluated six SOLO classifications, reaching 100% consensus after 61% initial agreement.

Dependability refers to the degree to which data changes over time (49). The dependability of this study was strengthened by using the analysis frames pre-test and post-test in strict compliance.

Transferability refers to the extent to which findings can be transferred to other samples or settings (Graneheim & Lundman 2004). In this study, the transferability was decreased by the fact that only 43 students out of 69 drew concept maps. Furthermore, the sample only represented Finnish nursing students. However, this study was carried out in typical nursing schools based on random cluster sampling.

The transformation of qualitative data into a quantitative form supported the evaluation of the outcomes of learning (III, IV). In the quantitative part, the validity of the statistical analysis was assessed. In the second and third part of Phase 2, statistical analyses were conducted with the help of a statistician.

6.2.5 Validity of the results

This study was not without internal and external validity problems (Grove et al. 2013). Threats to internal validity were taken into account concerning history, maturation, testing, instrumentation and selection (Cook & Campbell 1979). In the third part of Phase 2, in the evaluation of the outcomes of learning about an empowering discourse, maturation was prevented by the design, as there was only one week between the pre- and post-test phases. One week might be too short for students to process the information, but was suitable due to external events concerning an empowering discourse. Furthermore, the week between the pre-test and post-test phases did not include courses on empowering discourse or patient education in the participating polytechnics. The testing effect was minimized with the data collection method used. It was not the aim of the concept mapping method for the students to create similar concept maps twice, but to illustrate the students' individual knowledge. The selection was conducted using cluster sampling from randomly selected polytechnics.

Threats to the external validity of the study concerned the generalization of the results. The generalizability of the results is discussed in regard to sampling and samples (Parahoo 2006). Although the results of this study were mainly based on the qualitative part, the results can be seen as transferable due to the representativeness of the samples.

7. IMPLICATIONS FOR THE FUTURE

The implications of the results should be considered for nursing education, clinical practice and research in nursing science.

Implications for nursing education

- Knowledge about an empowering discourse in nursing and nursing education is the basis for learning how to conduct an empowering discourse. Nursing students need opportunities to learn about an empowering discourse in order to become highly competent patient educators in the future. This study indicates that using a computer simulation program can facilitate students' learning about an empowering discourse.

- The process of learning for nursing students can be facilitated using multimedia and information-technology based learning methods. These methods are also needed to develop students' learning about patient education. This study indicates that using the computer simulation program supports student to control the learning process. This is seen to support the development of students' empowerment. Student empowerment is necessary, since it has been stated that you cannot empower others if you are not empowered yourself.

- The outcomes of nursing students' learning should be evaluated in line with a constructivist learning approach. Therefore, there is a need to evaluate qualitative changes in nursing students' knowledge. This study showed encouraging results concerning nursing students' knowledge structures. Changes in students' knowledge to more holistic and better-organized knowledge supports the nursing students' competence in empowering patients.

Implications for clinical practice

- There is a strong emphasis on patient empowerment in health care. The need for supportive activities in the future is increasing. In particular, there is a need to support patients and population self-management. This study indicates that face-to-face education between nurses and patients can be modified to become more empowering. This modification, however, has to be based on scientific knowledge and a strong evidence base of patient education.

- Supporting patient empowerment needs to be systematic and appropriate for each patient. Therefore, nurses need to achieve sufficient knowledge about how to support patient empowerment in their education. This study indicates that

using the computer simulation program of an empowering discourse may support students to be more knowledgeable in supporting patient empowerment.

- Learning about empowering discourse is part of nurses' formal competence areas (Directive 2005/35/EU, ANA 2010, Directive 2013/55/EU). Evaluating the nursing students' knowledge about an empowering discourse helps to develop highly competent patient educators. This study indicates that there is a need to develop nursing students' knowledge about how to support patient empowerment in face-to-face education.

Implications for research

- Studies on empowering discourse and learning about it are quite rare. This study focused on empowering discourse based on qualitative studies and evaluated students' learning about conducting an empowering discourse. In the future, the effectiveness of an empowering discourse as a patient education method should be evaluated nationally and internationally. Learning methods for teaching how to conduct an empowering discourse should be studied further.

- The development and evaluation of multimedia and information technology learning methods is a demanding process. This study showed that a computer simulation program is suitable for the process of learning about an empowering discourse. Further studies, however, are required to validate the computer simulation program, for example by comparing it with other learning methods. Furthermore, the computer simulation program has to be developed and tested further to correspond to today's educational technology.

- Studies into students' knowledge of how to support patient empowerment are rare. This study indicates that qualitative evaluation is suitable to assess learning about empowering discourse. Further research is needed to investigate nursing students' competence in conducting an empowering discourse, for example studies focusing on students' skills and attitudes during an empowering discourse. The learning outcomes concerning an empowering discourse should be evaluated in clinical a context.

8. CONCLUSIONS

This study was the first study to evaluate nursing students' learning about an empowering discourse. Since an empowering discourse forms a vital part of patient education it was a relevant topic to study. This study produced new knowledge on an empowering discourse, and on a computer simulation as a learning method concerning empowering discourse and patient education. The main conclusions are summarized as follows:

1. The knowledge base concerning empowering discourse was strengthened. An empowering discourse is a structured method for empowering patient education. The description of it was created based on qualitative studies.

2. How to conduct an empowering discourse can be learned using the computer simulation program. Student control plays an important role in this learning.

3. Nursing students are more knowledgeable about an empowering discourse, but there is still a need to invest in nursing students achieving knowledge about an empowering discourse during their nursing education. This investment would also benefit clinical practice, and especially patients.

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