



Expertise
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Outcomes of patient education among elective surgical patients

Literature review

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<p>The purpose of the bachelor thesis was to describe the outcomes of patient education among elective surgical patients. In health care, professionals' work and inpatient care patient education is an essential element. The aim of patient education is to increase competence, confidence and self-efficacy in patients and able them to take an active role in their care. Good patient education supports patients' autonomous decision-making. Existing evidence support the importance of patient education: patient education can improve patient knowledge, satisfaction, and postoperative pain management and reduce anxiety and use of health care services and is financially profitable. There are numerous methods to use when providing patient education, such as face-to-face discussion, demonstration, pamphlets and written instructions, telephone discussion, video and internet. The aim is to use the knowledge received when developing patient education, thus the study question was: What are the outcomes of patient education among elective surgical patients.</p> <p>Bachelor thesis was carried out as a descriptive literature review. Reliable databases CINAHL, MEDLINE and MEDIC were used during data collection. Data retrieval yield 12 articles that were relevant to the thesis and were analyzed according to the study question by using inductive content analysis.</p> <p>The outcomes of this review were that patient education has positive outcomes on surgical patients, especially when it comes to cognitive outcomes like knowledge, self-efficacy and confidence. Educational interventions did not have a statistically significant positive impact on pain and anxiety, but patients had less postoperative complications, were satisfied with pain management and experienced faster recovery and rehabilitation.</p>	
Keywords	Outcomes, patient education, postoperative complications, surgical patient

Tekijä Otsikko	Rugira Muhamiriza Potilasohjauksen tulokset elektiivisen kirurgisen toimenpiteen yhteydessä. Kirjallisuuskatsaus.
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<p>Tämän opinnäytetyön tarkoitus oli kuvailla potilasohjauksen tulokset elektiivisen kirurgisen toimenpiteen yhteydessä. Potilasohjaus on tärkeä elementti terveydenhuollon ammattilaisten työssä. Sen tarkoitus on tukea potilaan omia kykyjä, parantaa potilaan itseluottamusta ja saada potilasta osallistumaan aktiivisesti omaan hoitoon ja hoitoa koskevan päätöksen tekemiseen. Potilasohjaus on osoittautunut kannattavaksi tehdyissä tutkimuksissa, potilasohjaus parantaa potilaan tieto ja taito, lisää potilastyytyväisyys, vähentää ahdistusta ja leikkauksen jälkeiset komplikaatiota ja se on myös taloudellisesti kannattava. Potilasohjauksessa käytetään erilaisia metodeja, kuten kasvokkain tapahtuvaa potilasohjaus, kirjalliset ohjeet, demonstraatio, video, puhelin- ja internetohjaus. Tämän opinnäytetyön tavoite on käyttää saatuja tietoja potilasohjauksen kehittämisessä, ja tutkimuskysymys oli: Mitkä ovat potilasohjauksen tulokset elektiivisen kirurgisen toimenpiteen yhteydessä?</p> <p>Opinnäytetyö toteutettiin kuvailevana kirjallisuuskatsauksena. Luotettavat tietokannat CINAHL, MEDILINE ja MEDIC käytettiin tiedonkeruussa. Opinnäytetyön aineistoon valittiin 12 artikkelia, jotka vastasivat parhaiten työn kysymykseen. Analyysissa käytettiin induktiivinen sisältö analyysi.</p> <p>Tuloksissa ilmeni, että potilasohjauksella on merkittävä vaikutus kirurgiseen potilaaseen. Potilasohjaus parantaa huomattavasti potilaan tietoa ja taitoa sekä itseluottamusta. Sillä ei ollut tilastollisesti merkittävää vaikutusta kipuun ja ahdistukseen, mutta potilaat olivat tyytyväisiä kivunhoitoon ja leikkauksen jälkeiset komplikaatiot olivat vähäisiä.</p>	
Avainsanat	kirurginen potilas, leikkauksen jälkeiset komplikaatiot, potilasohjaus, tulokset

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1 Introduction

In health care professionals' work and inpatient care patient education is an essential element (Kääriäinen & Kyngäs 2006). Patient education is a continuous process in a patient pathway and an important tool for nurses. There have been a lot of patient education researches all over the world in all nursing areas. Information retrieval using the words "patient education" and "surgical patient" in CINAHL produced over 700 studies from 2005 to 2017, 21 studies in Medic and 95 studies in Medline by computer suggesting words "patient education as a topic" and "general surgery".

This highlights the importance and up-to-date of patient education. The main factors affecting the development of patient education are lack of time to educate patients, the need to empower the patients to be more active and to increase patient's responsibility and independence in their treatment and not forgetting the short stay in hospital (Lipponen, Kyngäs & Kääriäinen 2006).

The purpose of the thesis was to describe the outcomes of patient education among elective surgical patients. Patient education is delivered in many different methods, such as printed materials, face-to-face (verbal education), audiovisual, demonstration and web-based education (Sesser 2018, 53-54). These methods are continuously being developed to meet the needs of patients and to serve and facilitate health care professional's work. Despite the used educational method, the aim of education is to achieve the desired outcomes that have been discussed between the patient and the health care professional in the education planning process. The learning needs should be realistic and able to achieve. (Sesser 2018, 53.)

Health care outcomes can be improved through patient education (Paterick, Patel, Tajik and Chandrasekaran 2017), which makes it an important factor in nursing. Informed patients have shown great signs to comply with medical treatment paths, less likely to experience complications and find their unique way to manage with disease (Bastable 2006, 9).

2 Key concepts

The concepts in this thesis work are patient education, clinical outcomes and surgical patient. The key concepts are based on the limitation of the topic and will guide to answer the questions.

2.1 Patient education

Bastable (2006, 11) defines patient education as “a process of assisting people to learn health-related behaviors so that they can incorporate those behaviors into everyday life.” The bases of the patient education are customer-oriented, patients’ needs and patients’ individual experience on disease or operation (Kääriäinen et al. 2006, Lipponen et al. 2006). It is planned interaction between the health care professional and client and it has goal(s). Thus, the purpose of patient education is to help the patient to achieve those goals (Bastable 2006, 11).

Before the start of patient education, the educator has to find out through the established relationship what the patient knows, and he/she might possibly need to know. For a patient to participate in decision making, he/she needs information and this information is delivered in education (Kesänen, Leino-Kilpi, Lund, Montin & Valkeapää 2016). Patient education is used to activate the client or patient and to promote his/her ability to enhance (Lipponen, Kanste, Kyngäs & Ukkola 2008) and “to achieve the goal of optimal health and independence in self-care (Bastable 2006, 11).

It has been found that patient education has a great impact on patient outcomes and postoperative complications among surgical patients. Postoperative complications are defined to be any deviation from expected outcomes or normal course (Dindo, Demartines & Clavien 2004). There is always a risk of postoperative complications in surgical patients, as common as it is. In some patient groups, the rate of complication is up to 30%. (Tevis & Kennedy 2013.) Increased preoperative anxiety is correlated with problems like hypertension, dysrhythmias or might be the reason patients refuse for planned surgery (Niggusie et al. 2014) while increased postoperative anxiety is linked to increased pain levels, prolonged recovery, increased risk for infection and increases fear of engaging in activities (Niggusie et al. 2014; Sadati et al. 2011 & Mi-Ling Wong et al. 2011). Numerous studies show positive effects of patient education to patient empowerment and therapeutical outcomes: reduced anxiety and fear (Lipponen et al. 2006),

increased patients' knowledge level (Kesänen et al. 2016) and improved patient's confidence in self-management (Bisbey et al. 2017).

Patient education process, like any other education process, is systematic and logical and consists of teaching and learning operations. Patients are individuals and learning abilities differ, so it is nurses' role to identify learning method of a patient and act as a facilitator and motivate to learn. The basic elements of the education process are assessment, planning, implementation and evaluation (Bastable 2006, 9-11). Assessment consists of assessing patient's learning needs. The planning process is about setting the goals of the wanted outcomes (Sesser 2018). In the patient education, the evaluation of outcomes is determined by the changes that occur in knowledge, attitude and skills. This process requires the participation of both nurse and patient and significant others if needed. (Bastable 2006, 9-11.) In this review patient education is considered as interventional knowledge or education given to an elective surgical patient during the perioperative phase.

2.2 Outcomes

The outcome is defined as "the result of actions that may be intended or unintended" (Bastable, Gramet, Jacobs & Sopczyk 2011, 613). Dictionary.com adds that the outcome is a result reached through a process of reasonable thinking. Capuzzo and Moreno (2010) define clinical outcome as immediate short-term or long-term end consequence of therapeutic and healthcare interventions applied to patients.

2.3 Surgical patient

A surgical patient is a person who needs surgery because of disease or sudden illness (Holmia, Murtonen, Myllymäki & Valtonen 2004, p. 16). Elective surgery is planned and beforehand fixed procedure (Ahonen et al. 2016, 101). There is a patient pathway for the elective surgical patient. First, the evaluation of urgency to do the procedure is done and the decision to operate is confirmed. Then the preoperative phase counseling and preoperative examination. After the operation time is reserved the patient does the preoperative visit to the hospital or if not possible, this conversation is done via telephone. Before the operation, the premedication is ordered by an anesthetist. After the operation, the patient is removed to the recovery room and from the recovery room to the surgical ward for follow-up. (Ahonen et al. 2016, 101.) Only studies about elective surgical patients and

staying overnight were included in this thesis due to inadequate time to educate otherwise. Lack of time can be caused by nurses' workload and staff shortage (Ghorbani, Soleimani, Zeinali & Davaji 2014).

3 Purpose, aim and study question

The purpose of this thesis was to describe the outcomes of patient education among elective surgical patients. The ultimate goal is to use the knowledge received when developing patient education. Thus, the study question is: What are the outcomes of patient education among elective surgical patients.

4 Data collection method, data collection and data analysis

4.1 Descriptive literature review

A literature review is a way of summarizing existing literature of any one topic which is being studied. The aim is to use existing evidence (qualitative or/and quantitative evidence) on a specific topic to interpret and explain them for a bigger picture. (Stolt, Axelin & Suhonen 2015, 9.) A literature review is important because it combines isolated works of literature to form one understandable overall about the topic being studied. Aveyard (2010, 8-10) sees literature review as the whole jigsaw. Carnwell and Daly (2001) stress that critical appraisal and synthesis of literature review help to identify gaps in the knowledge so it can be studied further.

A descriptive literature review describes the existing literature on the topic, and the purpose of the researcher is to answer to the study question in his/her review (Stolt et al. 2015, 9). It also critiques the literature and draws conclusions about the topic as well (Cronin, Ryan & Coughlan 2008). Data collection and data analysis are the processes of a literature review. Data is needed to have a complete understanding of what is known about the topic, and for that, the researcher needs comprehensive data. (Stolt et al. 2015, 9.)

4.2 Data collection

Data collection was done systematically. In systematic data collection, it is important to find the essential and reliable databases for data collection (Stolt et al. 2015, 37). In systematic search a writer identifies relevant literature for the topic, he/she develops “logical and relevant” search terms and use inclusion and exclusion criteria to avoid irrelevant literature (Aveyard 2010, 69). Developing search terms is essential because it helps to narrow down the results on irrelevant literature and generate more results that are relevant to the research (Carnwell & Daly 2001).

Different databases that offer relevant nursing science articles were used in this review. A list of reliable databases was given by thesis instructor and school’s librarian. Databases that were used in data collection are CINAHL, MEDLINE and Medic. CINAHL (Cumulative index to nursing and allied health literature) is one of the most central databases that includes comprehensive references to nursing science and allied health data. MEDLINE is an American database that includes American and abroad published biomedical journals. Medic is a Finnish health science database, with references to articles, books, dissertation and thesis published in Finland. (Stolt et al. 2015, 45-48.)

Data collection was started by using online databases for knowledge retrieval. To generate data related to the topic, carefully considered search terms were developed and used according to Carnwell and Daly (2001). The search terms were patient education OR preoperative education OR postoperative education AND outcomes OR effects OR impact OR postoperative complications OR pain OR anxiety OR knowledge OR patient satisfaction AND surgical patients OR elective. The research was limited to English or Finnish language, published research, 2009–2018, academic journal and adults. (Table 2.)

Inclusion and exclusion criteria were used to help select appropriate literature for the review (Table 1). Cronin et al. (2008) stress that inclusion and exclusion criteria are part of a systematic literature review and they assess the validity and reliability of the review in the eyes of the reader. Information retrieval can produce a massive volume of literature that might be difficult to manage without using inclusion and exclusion criteria.

Table 1. Inclusion and exclusion criteria

Inclusion criteria	Exclusion criteria
<ul style="list-style-type: none"> • elective surgery • adults • 2009–2018 • English or Finnish language • academic journal • Published research 	<ul style="list-style-type: none"> • review • pediatrics • trauma patients • Unpublished research • day surgery • outpatient

Some articles were identified to be relevant to studies by abstract, but full text was not available in databases. In that case, Metropolia's library and information services were used to get full texts or manually search was conducted. 16 articles with full text available were selected to read thoroughly and 12 (n=12) articles from those were selected to include in thesis literature. (Table 2, Appendix 1.) The criteria for selecting these studies was that their contents were most relevant to the study's purpose and question.

Table 2. Information retrieval

Data-base	keywords	limits	hits	ti- tle	abst- ract	full text	se- lected
CINAHL	patient education OR preoperative education OR postoperative education AND outcomes OR effects OR impact OR postoperative complications OR pain OR anxiety OR knowledge OR patient satisfaction AND surgical patients OR elective surgical patients	2009-2018, English, adults, academic journal	317	36	24	13	9
Medline	patient education OR preoperative education OR postoperative education AND outcomes OR effects OR impact OR postoperative complications OR pain OR anxiety OR knowledge OR patient satisfaction AND surgical patients OR elective surgical patients	2009-2018, English, adults, academic journal	792	21	12	3	3
Total							12

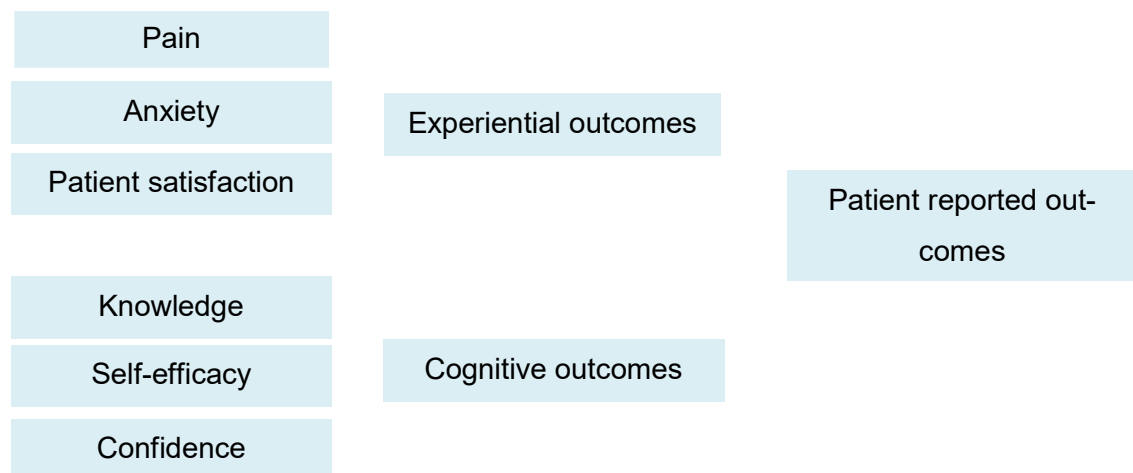
4.3 Data analysis

Collected data were analyzed by applying the principles of the content analysis. "Content analysis as a research method is a systematic and objective means of describing and quantifying phenomena". Content analysis is a good way to summarize and synthesize existing data on the topic into a clear abstract form. It provides a comprehensive

understanding of the topic, "new insights, a representation of facts and a practical guide to action". (Elo & Kyngäs 2007.)

The key element in content analysis is the classification of the same meaning parts of a text in smaller categories (Graneheim & Lundman 2004). Heinrich (2001) stresses the importance of classification in the content analysis by recommending to organize single concepts into themes as it helps the researcher to identify the links between concepts and themes. "Once the literature within each theme has been reviewed and synthesized, a short summary should identify the key arguments and how they relate to the next theme. This technique ensures that each theme flows appropriately on to the next theme so that the review as a logical structure." (Carnwell & Daly 2001.) The content analysis applies to qualitative and quantitative data analyzing also in the manifest (visible message) content and latent (possibly hidden) content. (Graneheim & Lundman 2004; Elo & Kyngäs 2007.) Rose et al. (2015) see the strengths of content analysis as its flexibility and coping with a large amount of data and as its weaknesses the bias that can appear during sampling and interpretation processes. Additionally, there has not been developed any right way to do content analysis (Elo & Kyngäs. 2007). Example of classification Figure 1.

Figure 1. Example of classification



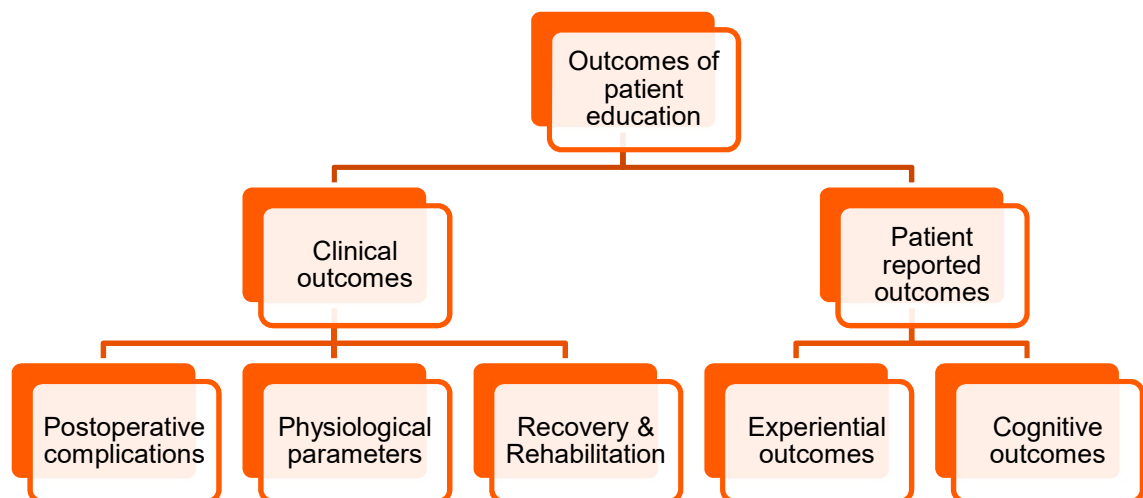
After selecting the literature, the analysis started by re-reading printed articles to get more familiarized with the content (Cronin et al. 2007). The study question was kept in mind during the whole analyzing process. In the next step, a Word document was created where the findings of each article relevant to the study question were written down. It is found important to start the inductive content analysis by coding as Elo and Kyngäs (2007) suggest because it will give the literature a theme and facilitate the next step of

classification. Sub-categories were formed from the open codes and groups were established. In grouping, sub-categories that are similar are put under an upper category as a sign of relation between them (Elo & Kyngäs 2007). The findings of analyzed articles were divided into 5 upper categories and grouped into two main categories, clinical outcomes and patient-reported outcomes. (Figure 2.)

5 Findings

Clinical outcomes were divided into three upper categories which were postoperative complications, physiological parameters and recovery and rehabilitation. Patient-reported outcomes consisted of two upper categories which were experiential and cognitive outcomes. (Figure 2.)

Figure 2. Results of analysis



5.1 Clinical outcomes

5.1.1 Postoperative complications

Postoperative complications were developed less in intervention groups. Postoperative nausea and vomiting occurred in significantly lower rates in the intervention group than in the control group (Sadati et al. 2011). Moreover, in another intervention group,

developed rates of postoperative complications like lower extremity edema, urinary retention, constipation, respiratory and cardiovascular complications were significantly lower (Chun-Yan et al. 2012). However, Klaiber et al. (2018) did not detect any statistically significant difference in similar postoperative complication items between intervention and control group in their study about preoperative patient education impact on postoperative complications. Additionally, Chevillon et al. (2015) revealed that despite the additional multifaceted education intervention group's patients had, they developed postoperative delirium incidents at the same rate as the control group.

Patient education does not have a statistically significant impact on length of hospital stay. Out of 12 studies, four reported outcomes related to the length of hospital stay (Sadati et al. 2011; Mi-Ling Wong et al. 2009; Klaiber et al. 2018 & Chun-Yan et al. 2012.) In one study by Chun-Yan et al. (2012), there was a clear difference in length of hospital stay, which was much shorter in the intervention group. Three other studies (Sadati et al. 2011; Mi-Ling Wong et al. 2009 & Klaiber et al. 2018) did not detect a statistically significant difference in mean length of stay between two groups, even though patients in intervention group stayed shorter period.

5.1.2 Physiological parameters

According to studies patient education might impact positively physiological parameters. Vital signs stabilization was faster in intervention group due to the education they received in the preoperative phase (Sadati et al. 2011). In a study conducted by Bahrami et al. (2013) found that patient education had a positive impact on the increment of serum cortisol level but did not have a statistically significant positive impact on vital signs. However, they mention less increment in the intervention group than in the control group.

5.1.3 Recovery and rehabilitation

Based on the analyzed studies, intervention education has a positive impact on recovery and rehabilitation. Becoming alert earlier and effective cooperation with nurses, faster stabilization of vital signs, less postoperative complications (Sadati et al. 2011) and good pain management (Cooke et al. 2016) have a great positive impact on recovery. Patient education has also a positive impact on rehabilitation at the hospital. One study reported a shorter time interval to first walk on feet after surgery in the intervention group. (Sadati et al. 2011.) When it comes to postoperative follow-up, a positive impact of patient education is found in favor of intervention groups. Studies show that the amount of time

spent in the postoperative phase by nurses in follow-up appointment or postoperative education is much less in intervention groups. (Gadler et al. 2016; Bisbey et al. 2017.)

5.2 Patient-reported outcomes

Patient-reported outcomes are reported in two categories, which are experiential outcomes and cognitive outcomes. Each category has its subcategories. Experiential outcomes consist of pain, pain management, anxiety and satisfaction. Cognitive outcomes consist of knowledge, self-efficacy and confidence.

5.2.1 Experiential outcomes

Pain

Due to patient education, patients in the intervention group experienced lesser pain and had pain management better in control. Patients experienced statistically significantly lesser pain during hospitalization (Mi-Ling Wong et al. 2009). In a study by Sadati et al. (2011) the duration of postoperative pain was much shorter in the intervention group than in the control group. Results indicate that both groups had a similar level of pain at the baseline. In one study, after baseline pain levels diminished at each time point it was measured until discharge (Cooke et al. 2016). Additionally, pain control was successful in the intervention group. However, two studies (Mi-Ling Wong et al. 2009 and Cooke et al. 2016) found that the pain levels were not statistically different between the two groups. Cooke et al. (2016) state that pain levels diminished at the same rate between the two groups to beyond discharge and Mi-Ling Wong et al. (2009) found that pain levels did not differ significantly after discharge.

Anxiety

Results indicate that patient education might reduce preoperative and postoperative anxiety. 10 of 12 articles reported anxiety related findings and half of those reported a statistically significant reduction of anxiety scores in favor of educational intervention group (Bisbey et al. 2017; Bahrami et al. 2013; Sadati et al. 2011; Mi-Ling Wong et al. 2009 & Chun-Yan et al. 2012). Exposing patients in the intervention group to additional information was beneficial and helped to decrease emotional distress in mentioned studies. In a study by Bisbey et al. (2017) 91% of patients agreed strongly with a statement that they felt less anxious and nervous after preoperative patient education. Similarly, state and trait anxiety level decreased significantly in the intervention group after receiving preoperative education (Mi-Ling Wong et al. 2009).

However, in some studies, additional education did not yield the desired effects. Fraval et al. (2015) and Cooke et al. (2016) found that despite educational intervention, there were no signs of reduction in anxiety scores at any of the time points from admission to discharge. On the contrary, Chevillon et al. (2015) and Gadler et al. (2016) found that anxiety decreased numerically but with no statistically significant difference in intervention and control group. In one study (Klaiber et al. 2018), the effect of education was seen beyond discharge on postoperative day 30, the control group had significantly higher depression scores than intervention group, although anxiety and depression scores were comparable between two groups during hospitalization and immediately after discharge.

Patient satisfaction

All in all, patients were satisfied with the educational intervention provided. Patients were most satisfied with the format of education and content, and how it helped to cope in the postoperative period. Patients judged the educational intervention as easy and clear to understand, good quality, and adequate information. They also identify the importance of patient education and its positive impact on postoperative recovery. Due to educational intervention, patients were able to address their worries on time, reinforce information they gained from standard education and felt better prepared for surgery. (Klaiber et al. 2018; Kesänen et al. 2016; Gadler et al. 2016; Fraval et al. 2015; Bisbey et al. 2017 & Goldstein & Hadidi 2010.) Patients' satisfaction with pain management was poorly reported in articles, but patients assessed postoperative pain management satisfaction very high, up to 91% of participants (Cooke et al. 2016).

Goldstein and Hadidi (2016) stated that the vast majority in their experimental study was satisfied with their hospital stay, while according to Bisbey et al. (2017) patients were satisfied with the increment of confidence due to patient education. Some of the satisfaction results were comparable between the intervention group and the control group, with no statistically significant difference, but in a positive way (Klaiber et al. 2018).

5.2.2 Cognitive outcomes

Knowledge

Analyzed studies demonstrated a significant improvement in patients' knowledge level after educational intervention and excellent knowledge retention after surgery up to six months. All studies found that intervention group achieved greater improvement in knowledge level than the control group (Chevillon et al. 2015, Goldstein and Hadidi 2010,

Gadler et al. 2016 and Fraval et al. 2015). Kesänen's et al. (2016) trial indicated that both groups experienced improvement in empowering knowledge level, but the intervention group's improvement was statistically greater in all-time points, except at baseline. For the sake of improved knowledge levels, patients were better prepared for the period following surgery (Chevillon et al. 2015) and their expectations of recovery were much clearer (Goldstein & Hadidi 2010 & Gadler et al. 2016). Fraval et al. (2015) stated that patients who participated in knowledge educational intervention had a better understanding in areas like common side effects, time to recovery and alternatives to surgery, which are related to patient's ability to provide informed consent. The retention of knowledge gained in preoperative education was examined and Gadler et al. (2016) found that patients had a similar level of knowledge at the first post-surgical follow-up as they did in the first posttest. In another study, knowledge was retained and remained stable from admission up to six months after surgery (Kesänen et al. 2016).

Self-efficacy and confidence

The importance and effect of patient education were seen in increased self-efficacy and confidence. Patients reported that educational intervention encouraged them to be more active in their postsurgical period, felt less insecure and believed that they were going to manage in self-care at home. Patients in the intervention group experienced improved confidence in pain management and were able to control the pain (Mi-Ling Wong et al. 2009). Patients were more confident when performing clinical procedures independently at home and felt less fear of doing something wrong. (Bisbey et al. 2017 & Klaiber et al. 2018.)

6 Discussion

6.1 Discussion of the results

The bachelor thesis' purpose was to describe the outcomes of patient education among elective surgical patients. Literature was collected from reliable databases and included relevant articles to thesis were used to answer to study question. Education methods varied and consisted of face-to-face discussion (Sadati et al. 2011; Chevillon, Hellyar, Madani, Kerr & Kim 2015), telephone discussion (Kesänen et al. 2016), DVD (Gadler, Crist, Brandstein & Schneider 2016), lecture (Klaiber et al. 2018), pamphlets (Bisbey et al. 2017), website (Fraval, Chandrananth, Chong, Tran & Coventry 2015), demonstration (Chevillon et al. 2015) or the combination of two or more (Bahrami et al. 2013). The

results were analyzed according to the study question by using inductive content analysis. Findings were categorized into two main categories, clinical outcomes and patient-reported outcomes. There was no negative impact of patient education found in any of the studies, but plenty of no statistically significant difference in results between the intervention group and control group were reported. This basically means that the additional knowledge provided to surgical patients was not so effective than standard education. The key outcome of this thesis is that patient education might have positive outcomes on elective surgical patients and it is a vital tool for both health care professionals and patients as it enables patients to involve in their health care and this has been largely linked to improved quality of care and better health outcomes (Dreeben 2010, 4-5).

The results of analyzed articles were divergent when it comes to postoperative complications. The results showed that patient education did not prevent or decrease significantly the postoperative delirium and length of hospital stay but was an effective method to reduce postoperative complications related to cardiovascular, respiratory and mobility. Articles also found conflicts in results about the impact of patient education. The same study reported a positive impact of patient education on serum cortisol level but did not affect vital signs from increasing after surgery. Some studies did not find statistically significant in length of hospital stay while others did. Length of hospital stay can be used as an indirect measure of recovery and wellness of the patient. Factors like anxiety, depression, delirium and other postoperative complications can affect the length of hospital stay. (Mi-Ling Wong et al. 2009; Chevillon et al. 2015.) A study conducted in New Zealand to determine the preoperative intervention's impact on postoperative respiratory complications and length of hospital stay showed that there was a significant decrease in postoperative pulmonary complications and incidents of hospital pneumonia halved but there was no significant difference detected in length of stay (Boden et al. 2018). It is not clear what caused a variety of outcomes, whether it is the method of education or other factors.

The positive impact of patient education was more related to patients reported outcomes. Studies that evaluated education method's impact on knowledge and self-efficacy reported increased knowledge level and improved patients' beliefs in themselves (Jukka et al. 2016 and Bisbey et al. 2017). Majority of the patients reported reduced anxiety after the educational intervention. Kalogianni et al. (2015) reported comparable findings in their study, where they were estimating the effectiveness of a nurse-led preoperative education on anxiety with a sample of 395 patients. Still, those who did not report a

significant difference in anxiety experienced numerically anxiety reduction except that the reduction was not statistically significantly different between the intervention group and the control group (Chevillon et al. 2015). Patients in the intervention group were satisfied with pain management, were able to practice techniques to reduce pain and were confident to ask for pain medication when they were in pain. The previous study is consistent with this finding. One of the previous studies (Papanastassiou, Anderson, Barber, Conover & Castellvi 2011) finds that after patient education intervention group was better prepared for pain management and had a positive impact on patient satisfaction with pain control.

From the results, an observation was made related to knowledge and anxiety and the correlation between them. The articles that reported significant increment in knowledge level, did not report a significant reduction in anxiety. This did not live up to the author's preconception with these two items. Previous studies have shown that while the patients' knowledge increased, it has affected anxiety decreasingly (Kesänen et al. 2017). This finding was not detected in this review.

This review has some limitations. The first one is sample size. There is a lot of studies related to this topic and only twelve articles were chosen to include in bachelor thesis. The main reason for this was that thesis was done by one author, thus size had to be manageable by one person. Secondly, this is the school final project and first one author has done. The author tried the best to work ethically in the whole process of this thesis. Another limitation is that there was variation in education methods and target groups differ in terms of surgery they were having. This might cause conflicts when comparing results, but this was not the objective of this review.

Outcomes indicate that patient education may improve pre- and postoperative complications of elective surgical patients. Thesis' results suggest that patient are satisfied with educational intervention and exposing them to additional information does not generate negative effects. The author would suggest for future studies to examine the cause of variation in results of education and also the impact of preoperative education to the financial item since it was not reported even though it's an important aspect in future.

6.2 Validity

Validity is the trustworthiness and touchstone of research (Elo and Kyngäs 2007 and Cohen, Manion & Morrison 2007, 133–163). This means if the asked question, used methodology, design of the research, analysis and the outcome and their relation between each other are valid and appropriate (Leung 2015), and so that the research can be generalized, replicable and other typical kinds of validity (Cohen et al. 2007, 133–163). The process of review must be in detail and comprehensible to the reader. To increase the validity, the researcher must be neutral in data collection, analyzing and in reporting findings. Research measures might include some bias or inaccuracy and its researcher's responsibility to minimize them as much as possible. (Roberts, Priest & Traynor 2006.)

Authentic international databases (CINAHL, MEDLINE and Medic) were used to ensure the quality, validity and credibility of the research literature (Cronin et al. 2008). The strengths and limitations of the review were described accordingly (Elo & Kyngäs). Study question was formulated in a proper manner and does not mislead from the topic. The process of inductive content analysis was followed, and tables were included in the text to increase comprehension of validity in the analysis. The objective was to report unbiased results, so personal opinions were excluded in every process of the thesis.

6.3 Ethical considerations

The responsible conduct of research guidelines updated by the Finnish advisory board on research integrity (TENK) (2012) was taken into account. The thesis was implemented as a literature review, so it did not require research permit nor participants, thus no one's identity or privacy was in danger of maltreatment. Other researches' achievements and work were respected and referred to appropriately and their achievements were not snubbed in any sort of way. Appropriate reference was made in the text and in the reference list, and credit given if someone's work was referred to. Meticulousness work was done to comply with the standards set for scientific knowledge in conducting the research. The last but not the least, the bachelor thesis was run through Turnitin to avoid any kind of plagiarism or duplicating.

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Included literature

Authors, year of publication	Purpose of the study	Sample size	Data collection and analysis	Main findings
1. Bahrami, N., So-leimani, M.A., Sharif-nia, H., Shaigan, H., Sheikhi, M.R. & Mo-hammad-Rezael, Z., 2012. Iran	The purpose was to identify the ef-fects of preoperative education on anxiety levels of women undergo-ing elective surgery by examining the physiological parameters and serum cortisol levels	60 female elec-tive surgery can-didates were se-lected and allo-cated to either intervention or control group, 30 in each group.	Questionnaire Descriptive & in-ferential statis-tics in SPSS 17.0	Preoperative vital signs increased in both the groups despite the education the intervention group had received. However, the increments were significantly lower in the intervention group. The researchers found the mean serum cortisol level to be lower in the intervention group than in the control group ($P < 0.001$ in Mann–Whitney test).
2. Bisbey, C.C., Ristau, T.A., Johnson, M.D., Streed, M.M., Bursiek, A.A. & Grubbs, P.L., 2017. USA	To provide empowering education to patients and their significant oth-ers, so they can take an active role in their health.	A total of 209 pa-tients partici-pated in the pro-ject.	Survey	A preoperative education class for patients undergoing prosta-tectomy and their caregivers significantly reduced anxiety, and increased confidence in the immediate postoperative period. It also increased patient satisfaction regarding self-care at home and post-discharge instructions. It decreased provider time in postoperative teaching and follow-up.
3. Chevillon, C., Hellyar, M., Madani, C., Kerr, K. & Chae kim, S., 2015. USA	To evaluate the impact of multifac-eted preoperative patient education on postoperative delirium, anxiety and knowledge, and to explore pre-dictors of postoperative delirium,	A total of 129 pa-tients divided into two groups; experimental group $n = 63$,	Interview and questionnaires. SPSS software version 20.0 (SPSS Inc) was	Preoperative education did not reduce the incidence of post-operative delirium nor preoperative anxiety among PTE pa-tients. It decreased STAI scores in posttest in both groups but mean change did not differ significantly between both groups. Mean days of delirium and ICU stay did not differ significantly between the groups; however, the experimental group had

	days of mechanical ventilation, and days in the intensive care unit.	and control group n = 66.	used for all data analyses	significantly fewer mean days of mechanical ventilation than the control group.
4. Chun-Yan, Z., Yong, J., Qiu-Yang, Y., Feng-Jiao, C., Long-Le, M. & Le-Xin, W., 2012. China	The objective of the study was to evaluate the effect of nurse-initiated preoperative education and counseling on postoperative complications and anxiety symptoms following CABG.	A total of 40 patients were enrolled in this study and divided into study and control group, 20 each.	SPSS v13.0 was used for the statistical analysis. Comparison of numerical data between groups was performed by Student t test	The rate of postoperative complications such as edema, urinary retention, constipation, respiratory complications and cardiovascular complications in the study group were lower than in the control group. Nurse-initiated preoperational education and counseling had a positive impact on postoperative anxiety in the intervention group. The length of hospital stay was shorter in the intervention group compared to the control group.
5. Cooke, M., Walker, R., Aitken, L. M., Freeman, A., Pavey, S. & Cantrill, R., 2016. Australia	The purpose of this pilot study was to evaluate the feasibility of testing an education intervention to improve self-efficacy in patients undergoing hip or knee replacement.	A total of 91 participants, divided randomly to the intervention or the control group.	Self-report questionnaire & assessment. Data analysis was conducted using International Business Machines (IBM) SPSS version 22	Increased self-efficacy in both groups. Measures of pain diminished at each subsequent time point to beyond discharge. No significant differences between groups were noted in pain or anxiety scores reported at any of the time points (prehospital (T0) to 6 weeks post discharge (T5)). Satisfaction with postoperative pain management in both groups, but mainly in the intervention group. Levels of health service and resource utilized at 6 weeks postdischarge were also similar for both groups
6. Fraval, A., Chandrananth, J., Chong, Y.M.,	The purpose of the study was to evaluate whether the use of a patient information website, to	A total of 211 patients, random allocation into	Surveys Results were analyzed with the	There was a clinically significant increase in patient knowledge level for the intervention group. Satisfaction was also improved in the intervention arm and in the control arm although not at a

Tran, P. & Coventry, L.S., 2015. Australia	augment patient education and informed consent for elective orthopedic procedures is an effective measure.	two arms; 103 patients to the intervention arm and 208 patients to the control arm.	STATA statistical software package.	significance level. There was no difference between the control and intervention arm relating to their anxiety scores. Online patient education tool is an effective measure and should be used to augment patient education and informed consent.
7. Gadler, T., Crist, C., Brandstein, K. & Schneider, S.M., 2016. USA	The purpose of the study was to develop, implement and evaluate the effects of take-home education video, and to determine its effect in pre-surgical teaching patient retention, pre-surgical anxiety, and patient satisfaction with video format education and provider time in post-surgical teaching.	31 surgery patients were included in the final sample of the study.	A pre/posttest design.	There was a significant improvement in knowledge level between pretest and first posttest after viewing the educational video. All patients answered 100 % correctly at the second posttest. Very few patients reported pre-surgical anxiety and no statistical significance were found when comparing pretest and posttest scores. Patients also reported less worry and concern about the surgery over time. Compared to the standard postoperative follow-up appointment, provider time spent on re-educating was decreased. Patients were very satisfied with the education delivery format
8. Goldstein, N. & Hadidi, N., 2010. USA	The purpose of this study was to evaluate the effectiveness of structured pre-operative classes offered to bariatric patients and their families and to determine how these classes impact the patients' knowledge level of the hospital	The sample consisted of 27 patients who were admitted for bariatric surgery.	Questionnaire & survey.	There was a significant increase in knowledge level in patients, who got preoperative education. Attendees' overall hospital experience satisfaction score was 88 percent. Indicating a very high satisfaction level on hospital experience.

	experience and satisfaction with their inpatient stay.			
9. Kesänen, J., Leinokilpi, H., Lund, T., Montin, L., Puukka, P. & Valkeapää, K., 2016. Finland	The objective of the study was to assess the impact of a preoperative educational intervention on the knowledge level of patients with spinal stenosis.	A total of 87 patients, 47 patients in the intervention group and 40 in the control group.	A KNOWBACK Test. KNOWBACK Test was analyzed with analysis of variance (ANOVA). A t-test was used to analyze the differences between groups.	The knowledge level of the intervention group increased statistically (by 29 %) after admission to hospital in 5 dimensions, bio-physiological, functional, social, ethical and financial out of 6 (experiential) dimensions, and remained stable throughout the follow-up. Patients assessed the feasibility (clarity, intelligibility, adequacy) of the KTFI very high, meaning patient were satisfied with this kind of education method.
10. Klaiber, U., Stephan-Paulsen, L.M., Bruckner, T., Muller, G., Auer, S., Farrenkopf, I., Fink, C., Dörr-Harim, C., Diener, M.K., Bucher, M.W. & Knebel, P., 2018. Germany	The aim of the PEDUCAT trial was to investigate the impact of preoperative patient education on the postoperative complications in patients undergoing major visceral surgery.	A total of 244 patients were included (intervention group 138 and control group 106 patients).	The primary analysis was based on the intention-to-treat (ITT), additionally, a per-protocol (PP) analysis was performed.	Both groups experience some of the postoperative complications with, no significant differences between groups, except for in-hospital fall, which occurred only in the control group. Pain scores were comparable between the two groups before and immediately after surgery. On the 7th postoperative day (POD), the intensity of pain was significantly higher in the intervention group than in the control group. Depression values were significantly higher in the control group than in the intervention group since day 7 after surgery, while anxiety values were similar. Both groups were satisfied with the information delivery format and education content.

<p>11. Mi-Ling Wong, E., Wai-Chi Chan, S. & Chair, S-Y., 2009. China</p>	<p>The purpose of the study was to examine the effectiveness of pain management educational intervention on the level of pain, anxiety and self-efficacy among patients with musculoskeletal trauma and consequent orthopedic surgery.</p>	<p>A total of 125 patients were randomized in two groups, 62 patients in the experimental group and 63 in the control group.</p>	<p>Questionnaires The data were analyzed using the Statistical Package for the Social Sciences (SPSS) for Windows version 15.0.</p>	<p>The experimental group reported statistically significantly lower levels of pain and anxiety during hospitalization. At the 3-month evaluation, a statistically significant positive effect on anxiety level was found in favor of the experimental group. Experimental group patients had better self-efficacy during hospitalization (from pre-surgery to discharge). There was no statistically significant difference in length of hospital stay in both groups.</p>
<p>12. Sadati, L., Pazouki, A., Mehdizadeh, A., Shoar, S., Tamannaie, Z. & Chaichian, S., 2013. China</p>	<p>To evaluate the effects of nursing visits on preoperative patient anxiety and postoperative complications in laparoscopic cholecystectomy patients.</p>	<p>100 patients were randomly assigned into two equal groups of 50 patients each.</p>	<p>A semi-experimental and a patient questionnaire. The data were analyzed using Statistical Package for Social Sciences (SPSS) version 16).</p>	<p>State and trait anxiety decreased significantly in the intervention group after a nursing visit. The mean time to reach Aldrete consciousness score of 9 significantly lesser in the intervention group. Only 6% of the intervention group developed postoperative nausea and vomiting, significantly less than the 20% of the control group. Duration of vital sign stabilization, postoperative pain, nausea and vomiting, and time to patient's first walk were significantly lesser in the intervention group than in the control group. Patients in the intervention group became alert earlier and cooperated more efficiently with nurses. Length of stay and flatus were not significantly different between the two groups.</p>

