



# **MANAGEMENT OF LOWER EXTREMITY OEDEMA**

## **Patient Guidance Material on Compression Bandaging**

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Bachelor's thesis  
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## **ABSTRACT**

Tampereen ammattikorkeakoulu  
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Venous insufficiency is a chronic condition, which affects approximately 30-50% of the western adult population. Venous insufficiency can lead to venous hypertension and other symptoms, such as oedema and skin changes in the lower extremities. If not treated, venous insufficiency can ultimately lead to ulceration. Compression therapy is the primary method in the management of venous insufficiency. However, there can be problems with patient adherence, which can interrupt the care.

The purpose of this functional thesis was to promote patient adherence through the creation of patient guidance material on compression bandaging. We conducted a literature review in order to collect theoretical information about our key concepts. The aim of the thesis was to create patient guidance material on compression therapy and enhance adherence to care. The ultimate goal was to promote health and self-care of the patients.

The information we gathered from the literature review confirmed that patient education is important, since it impacts the outcomes of treatment positively. Patient adherence can be promoted with informative and clear written education material, combined with a good nurse-patient relationship. Adherence to treatment promotes the outcomes of compression therapy.

In the future, it would be beneficial to conduct research about the knowledge healthcare professionals have on compression therapy in different healthcare settings. In addition, gaining more information about patients' experiences and patient education regarding the implementation of compression therapy would be beneficial.

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Key words: venous insufficiency, venous ulceration, oedema, compression bandaging, patient adherence.

## TIIVISTELMÄ

Tampereen ammattikorkeakoulu  
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Laskimoiden vajaatoiminta on krooninen sairaus, joka vaikuttaa arviolta 30-50 prosenttiin länsimaiden aikuisväestöstä. Laskimoiden vajaatoiminta voi johtaa laskimopaineen nousuun ja muihin oireisiin, kuten alaraajojen turvotukseen ja ihomuutoksiin. Mikäli laskimoiden vajaatoiminta jätetään hoitamatta, voi se johtaa laskimoperäisen haavan syntyyn. Turvotuksen estohoito on laskimoiden vajaatoiminnan ensisijainen hoitokeino. Hoito kuitenkin usein keskeytyy moninaisten hoitoon sitoutumiseen liittyvien ongelmien vuoksi.

Tämän toiminnallisen opinnäytetyön tarkoituksena oli luoda potilasohjausmateriaalia, joka edistäisi sitoutumista turvotuksen estohoitoon. Teimme kirjallisuuskatsauksen saadaksemme teoreettista tietoa avainkäsitteistämme. Opinnäytetyömme tarkoitus oli luoda potilasohjausmateriaalia turvotuksen estohoidosta ja parantaa hoitoon sitoutumista. Tavoitteenamme oli edistää potilaiden terveyttä ja ohjeiden mukaista hoidon toteuttamista.

Kirjallisuuskatsauksesta keräämämme tieto osoitti potilasohjauksen tärkeyden hyvien hoitotulosten saavuttamiseksi. Informatiivinen ja selkeä kirjallinen opetusmateriaali yhdistettynä hyvään hoitaja-potilassuhteeseen edistää hoitoon sitoutumista ja täten myös turvotuksen estohoidon tuloksia.

Tulevaisuudessa olisi hyödyllistä tehdä tutkimusta terveysalan ammattilaisten tietoudesta turvotuksen estohoitoon liittyen erilaisissa terveydenhuollon ympäristöissä. Potilaiden kokemukset ja potilasohjaus turvotuksen estohoidon toteuttamisen liittyen olisivat myös hyvä tutkimuskohde.

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Avainsanat: alaraajojen laskimoiden vajaatoiminta, laskimoperäinen haava, turvotus, tukisidokset, hoitoon sitoutuminen.

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## 1 INTRODUCTION

Venous insufficiency is a chronic condition, where blood flow in the lower limbs is impaired. Venous insufficiency occurs as a result of incompetent venous valves. Venous insufficiency can lead to venous hypertension and other symptoms, such as oedema and skin changes in the lower extremities. If not treated, venous insufficiency can lead to ulceration. Venous ulcers are open sores, which tend to be chronic in nature. They often take months or years to heal and their recurrence rate is high. It is typical for venous ulcers to have cycles of ulceration, healing and recurrence. (Finlayson, Edwards & Courtney 2011, 2181.)

It is estimated that approximately 30-50% of the western adult population suffers from some degree of venous insufficiency (Current Care Guidelines 2010; Finlayson et al. 2011, 2181). The prevalence of venous ulceration in adult population is around 1% to 2% (Finlayson et al. 2011, 2181). The prevalence of venous ulcers increases with age and it is estimated that the incidence of venous ulcers will rise in the future, since the number of elderly people in the population will increase (Iwuji 2008, 16).

Compression therapy is the most efficient way to manage venous insufficiency (Anderson 2006, 225). It can be carried out with either compression bandages or stockings (Moffat, Kommala, Dourdin, Choe 2009, 386). Compression therapy enhances the function of the venous valves and reduces venous pressure by providing external pressure on the veins. The external compression pushes fluids back into the circulation, which will reduce oedema and enhance the wound healing process. (Anderson 2006, 225.)

Adherence to compression therapy is crucial, since without active intervention, up to 70% of venous ulcers recur, often in three months from healing (Finlayson et al. 2011, 2181). Even though compression therapy is known to be the mainstay treatment for venous insufficiency, some patients have difficulties in committing to the care. Non-adherence is an issue, because it can lead to decreased healing rates and increased recurrence rates. (Moffat et al. 2009, 387.) Adherence to care can be promoted with interventions, such as regular follow-up visits and patient education (Finlayson, Edwards & Cortney 2014, 96). Patients are more committed to the care, if they are

given detailed information about their condition and compression therapy (Iwuji 2008, 18).

Our Bachelor's thesis is a functional thesis with a product. The product is written patient guidance material on compression bandaging. Our target group is patients with lower extremity oedema caused by venous insufficiency. The material is meant for the patients, but also for their caregiver(s). Our working life connection, the Pirkanmaa Hospital District, has expressed a need for patient guidance material, since their current material does not meet their needs. The material, which we produce, includes photographs and clear instructions on compression bandaging. It is provided in Finnish and in English.

## **2 PURPOSE, TASKS AND OBJECTIVES**

The purpose of our Bachelor's thesis is to prepare patient guidance material on compression bandaging for the Pirkanmaa Hospital District.

The aim of our Bachelor's thesis is to provide material on compression therapy and enhance adherence to care.

The ultimate goal of our Bachelor's thesis is to promote health and self-care of the patients.

In our thesis, we will answer the following questions:

- What is venous insufficiency?
- What is compression therapy?
- How to apply compression bandages using the anatomical application technique?
- How can patient adherence be promoted with written guidance material?

### **3 THEORETICAL STARTING POINTS**

#### **3.1 Venous insufficiency**

Venous insufficiency is a chronic condition, which is usually progressive. There is no known cure for this condition. However, there are ways to treat this condition and slow down its progress. In this thesis, we are going to concentrate on the non-pharmaceutical ways of treatment, the main interest being on compression treatment. In order to understand reasons for the treatment, it is important to understand the condition behind it (Current Care Guidelines 2014). In this section, we will discuss the main factors regarding venous insufficiency and its development.

##### **3.1.1 Aetiology**

Veins are blood vessels, which carry blood from the tissues towards the heart. Unlike arteries, veins have less muscular walls, which can cause pooling of blood in the veins. Due to this, venous return is assisted by the action of skeletal muscles in the lower limbs. (Smeltzer, Bare, Hinkle & Cheever 2010, 849.) There are three main types of veins located in the lower limbs: superficial, deep and perforator veins (Lay-Flurrie 2011, 4). These veins have valves, which ensure that the blood flows towards the heart. If the valves are incompetent or faulty, blood cannot flow against the force of gravity, which can cause fluid accumulation in the lower extremities. (Smeltzer et al. 2010, 849, 880.) While exercising and walking, the valves open and close by the action of the calf muscle. The contraction of the muscle increases the pressure within deep and superficial veins, which pushes blood upwards in the veins. When the muscle relaxes, the pressure decreases and the valves close. (Lay-Flurrie 2011, 4.)

Venous insufficiency is a condition that occurs due to incompetent action of venous valves. The valves are pushed apart due to increased pressure, which is known as venous hypertension. In venous hypertension, a backflow of blood occurs, since the valves are unable to close properly. This increased volume of blood expands the veins, leading to extravasation of fluids and cells into surrounding tissues. (Lay-Flurrie 2011, 4.)



The aetiology behind venous insufficiency can be divided into primary and secondary reasons. Primary insufficiency arises from no known cause, but it is associated with risk factors, such as prolonged standing. Secondary insufficiency is caused by obstruction or damage of the valves, such as trauma, surgery or deep vein thrombosis. (Lay-Flurrie 2011, 4.)

### **3.1.2 Symptoms**

Venous insufficiency can lead to diverse symptoms, which range from mild to severe. Generally existing symptoms are varicose veins, oedema in the lower limbs and local skin changes. However, venous insufficiency can exist as latent and the appearance of a venous ulcer can be the first sign of the condition. Venous insufficiency can become more severe, if the calf muscle is not working properly. (Juutilainen & Hietanen 2013, 270.) This can be the case with immobile or elderly people, who are unable to walk normally. Impaired mobility combined with the loss of muscle strength can lead to a situation, where the calf muscle is unable to squeeze veins sufficiently and thus push blood back upwards (Lay-Flurrie 2011, 4.) Venous insufficiency can also become more severe in cases, where the patient has more than one medical condition. For example, heart failure is one of the conditions, which can worsen venous return. (Juutilainen & Hietanen 2013, 270.)

Varicose veins are abnormally dilated and twisted veins, which usually appear in the lower limbs. Varicose veins are caused by the incompetent action of venous valves. Due to this inadequate action, a backflow of blood occurs, since the valves cannot close properly. Backflow leads to pooling of the blood in the veins, causing them to enlarge. Varicose veins are usually located near the surface of the skin, because superficial veins are more easily affected. Deep veins can also become affected, but it is not common. The appearance of varicose veins can vary, but they are usually bulging or twisted and are blue or dark purple in colour. Varicose veins are usually symptomless, but their appearance can be disturbing for the patient. The symptoms that are associated with varicose veins include aching, burning sensation, muscle cramps, and pain (Smeltzer et al. 2010, 882; National Health Service 2012.)

Venous insufficiency can lead to various changes in skin colouration and consistency. Venous hypertension causes extravasation of blood, which will stain the surrounding tissues (Smeltzer et al. 2010, 882.) The staining of tissues happens due to a process called haemosiderin staining, where red blood cells break down and as a consequence, the skin becomes brownish (Anderson 2008, 50.)

Lipodermatosclerosis is a skin condition, which is strongly associated with venous insufficiency. Lipodermatosclerosis can be classified as a type of panniculitis, which is the inflammation of subcutaneous fat. Lipodermatosclerosis can lead to various symptoms, such as hardening of the skin, redness, swelling and increased pigmentation in the legs. (Nazarko 2009, 716.)

As mentioned earlier, an increased volume of blood in the veins is caused by the valves not closing properly creating a backflow of blood. The excessive volume of blood leads to congestion in the veins, which slows down blood flow. As a consequence, white blood cells start to attach to each other. This will trigger inflammatory reactions, which will aggravate local tissue damage. Since blood flow is decreased, there is also less nutrients available to maintain healthy skin. This, in turn, causes the skin to become dry and itchy. Dry skin combined with lipodermatosclerosis will make the legs extremely fragile and thus, even a small scratch can lead to ulceration (Anderson 2008, 50.)

### **3.1.3 Risk factors**

The root cause of venous insufficiency is unknown, but several risk factors have been identified. There have been contradictory study results regarding some factors, for example obesity (Current Care Guidelines 2014). Most common risk factors are presented in table 1 on the next page.

TABLE 1. Risk factors for developing venous insufficiency (Dowsett 2005, 66.)

Risk factors:
Family history of leg ulcers
Deep vein thrombosis
Varicose veins and operations
Leg trauma
Obesity
Pregnancy
Prolonged standing

### 3.1.4 Clinical examinations

It is important to distinguish venous insufficiency from peripheral arterial disease, as this affects the guidelines of the care. For example, compression therapy should not be used if the patient has peripheral arterial disease, as this will weaken the already impaired arterial circulation. The patient's peripheral arterial status is examined by finding out the ankle-brachial index value (ABI). The value is measured by using a blood pressure cuff and a hand-held Doppler device. Firstly, the brachial systolic blood pressure is measured from both arms of the patient. After this, the blood pressure is measured bilaterally from the patient's ankle at the posterior tibial and dorsalis pedis. In order to determine the ABI value, the highest ankle pressure value is divided by the highest brachial pressure value. A normal ABI value is 0.9-1.1. A value below 0.9 indicates that the patient has peripheral arterial disease (Werchek 2010, 47-48.)

Peripheral arterial disease is a contraindication to compression treatment, because the rapid passage of fluids within the body can worsen the patient's heart condition.

Pressure caused by compression therapy can also damage the fragile skin near the bony prominences and increase the risk of pressure ulcers (Juutilainen & Hietanen 2013, 286.) If the patient suffers from diabetes and high blood pressure, the ABI value can be falsely elevated due to the incompressibility of the patient's vessels (Werchek 2010, 47, 48). Errors in measurement can be caused by several factors, such as a busy environment, the patient's sensation of pain and moving during the measurement, the nurse's lack of experience and abundant oedema (Juutilainen & Hietanen 2013, 284).

To classify venous insufficiency and its severity, a classification called CEAP is used. The letters CEAP stand for Clinical, Etiology, Anatomy, and Pathophysiology (Juutilainen & Hietanen 2013, 270.) The C and E classifications are presented in table 2.

TABLE 2. The CEAP classification (Juutilainen & Hietanen 2013, 271)

	C: Clinical findings
C0	No visible or palpable signs of venous disease
C1	Telangiectasies or reticular veins  Telangiectasy = Chronic dilatation of capillary veins and other small veins Reticular veins = Veins are in a netlike form (Webster's Encyclopedic Unabridged Dictionary of the English Language, 1996)
C2	Varicose veins
C3	Oedema
C4	Skin changes related to a venous disease
C5	Skin changes and a healed venous ulcer
C6	Skin changes and an active venous ulcer

	E: Etiologic classification
Ec	Congenital
Ep	Primary
Es	Secondary

C and E classifications are mostly used in clinical settings, since they give good basic information about the patient's situation. With the CEAP classification it is possible to obtain even more detailed information, since it also includes anatomic and pathophysiologic classifications. Anatomic classification covers information on superficial veins, deep veins and perforating veins. Pathophysiologic classification covers possible reasons for venous insufficiency, such as reflux and obstruction of the veins. When suspecting that the patient's wound has a venous origin, it is important to carefully examine the background information and the status of the veins. These classifications are part of the basic examinations when suspecting venous insufficiency (Juutilainen & Hietanen 2013, 272.)

When evaluating the need for care, classification presented in table 3 is used. The classification is based on the patient's symptoms.

TABLE 3. Classification based on the patient's symptoms (Current Care Guidelines 2010.)

Class	Patient's symptoms
0	Symptomless
1	Has symptoms, can work without compression hosiery or bandages
2	Has symptoms, cannot work eight hours a day without compression hosiery or bandages
3	Cannot work even when using compression hosiery or bandages

### 3.1.5 Prevention and management

The symptoms of venous insufficiency are usually managed with conservative treatment, such as compression therapy and lifestyle changes. Even though compression therapy has been proven to be the most important treatment in cases of venous insufficiency, other treatment methods can also be considered. In case the patient's condition indicates that invasive treatment is needed, surgical options can be considered (Current Care Guidelines 2010.) We will discuss compression therapy further in section 3.4.

The aim of conservative treatment is to reduce oedema and prevent ulceration with non-invasive methods. Elevating the legs on a daily basis decreases oedema, promotes venous return and relieves pain. Venous insufficiency can worsen, if the calf muscle pump is not working properly. The patient should be encouraged to exercise, since exercising, such as walking, improves the action of the calf muscle pump. (Smeltzer et al. 2010, 880.) In case there is a family history of venous insufficiency or if the patient is considered to be at high risk for developing the condition, prevention methods should be emphasised. In addition to exercising, the patient should avoid using clothes that are too tight in the groin area and avoid sitting legs crossed, as this can prevent the backflow of venous blood. (Terveyskirjasto 2012.) The patient should protect his legs from traumas that can lead to ulceration and choose his shoes carefully, because too tight shoes can rub the skin and cause an ulcer (Juutilainen & Hietanen 2013, 289.)

Surgical treatment can be considered, when there are complications related to venous insufficiency, for example when compression therapy does not sufficiently relieve the symptoms. Superficial veins are more often operated than deep veins, since results from operations are more efficient. The main goal of surgical treatment is to eliminate venous backflow. Even at its best, surgical treatment of deep veins can only reduce venous insufficiency, and compression therapy remains the most important treatment. However, there is only little research on the long-term differences between the results of surgical and conservative treatment. (Current Care Guidelines 2010.)

## **3.2 Venous ulceration**

Venous insufficiency causes alterations to the skin of the lower limbs. The skin can become inflamed and prone to scratches (Anderson 2008, 50.) Venous ulcers can then appear due to the spontaneous tearing of the skin or because of a small trauma, for example a scratch. Venous ulcers tend to situate in the gaiter area of the leg, where the venous pressure is high. There can be only one ulcer in the leg or several ulcers side by side. Venous ulcers tend to be large in size, but their size and shape can vary. Venous ulcers are usually shallow, covered by a yellow fibrin layer. They can be painless or cause pain. The pain is described to be aching or heavy. (Smeltzer et al. 2010, 881, 882; Juutilainen & Hietanen 2013, 266-269.)

### **3.2.1 Physical and psychosocial symptoms**

Venous ulcers can cause symptoms, such as pain, impaired mobility, exudate, and odour. Pain is the most frequently cited symptom related to venous ulcers (Maddox 2012, 43.) It can vary from mild to intense and there can be day-to-day variation (Persoon, Heinen, van der Vleuten, de Rooij, van de Kerkhof & van Achterberg 2004, 343). Pain can restrict the patient's daily living. For example, the patient may be unable to take his daily walks and his sleep might be interrupted (Maddox 2012, 43.) Pain can also exist during wound care and while wearing compression bandages. The patients have reported pain during wound cleaning episodes and during the application and removal of wound dressings. Pain associated with compression therapy has been reported to be more severe during the first weeks, but decreasing as the healing process progresses. Pain related to wound care and compression therapy is problematic, because it can lead to non-adherence to the treatment (Todd 2011, 1360.)

Impaired mobility is often pain-related. Standing and walking can aggravate pain and therefore some patients avoid moving. The patients may also avoid exercising, because they are afraid that it might promote the development of new venous ulcers. Other factors that can cause impaired mobility are wound dressings, swollen legs, exudate, and inability to wear appropriate shoes. Impaired mobility can lead to restrictions in daily activities, for example inability to take care of the personal hygiene (Persoon et al.

2004, 343.) Many patients with venous ulcers are dependent on family members to carry out the activities of daily living, such as shopping (Regmi & Regmi 2012, 62.)

Venous ulcers can secrete a great deal. Even though moisture is necessary for the wound healing process, excessive moisture can damage the wound bed and the skin around the ulcer. Excessive secretion can cause maceration, excoriation and odour. Leakage and odour can adversely affect the patient's psychological health and decrease the quality of life, as the patient may feel himself unclean and embarrassed (Maddox 2012, 45.) Excessive leakage can lead to wet shoes, stockings and sheets, which can be very distressing for the patient. The patient may have difficulties in maintaining his/her dignity and outward appearance. The patient may also be aware of the unpleasant smell, which is caused by the leakage (Persoon et al. 2004, 345.) Odour can lead to social isolation, because the patient can be afraid that the other people will notice the smell. Because of that reason, the patient may limit his/her social activities. (Maddox 2012, 46.)

According to the studies, having a venous ulcer can have a negative effect on the patient's mood and feelings. Some patients may experience feelings of regret, depression, loss of control, and hopelessness (Persoon et al. 2011, 345.) These negative feelings can arise due to many factors. Some patients can have a pessimistic view of the healing potential of their ulcerated legs. They can also be disappointed with the treatment (Persoon et al. 2004, 345; Maddox 2012, 46.) The patients may feel that there is not much to be done in order to speed up the healing process or reduce symptoms. The patients may also become overly cautious because of the ulcer and limit their daily actions in order to minimise the risk of aggravating the ulcer (Maddox 2012, 46.) They may not be willing to socialise because of pain, malodour, inability to dress appropriately, and the appearance of compression bandages (Regmi & Regmi 2012, 62.)

### **3.2.2 Management**

The management of venous ulcers starts from the reduction of oedema. When there is less oedema, the circulation in the tissues improves. The reduction of oedema also decreases the amount of wound secretion and improves the healing process of the ulcer.



Compression therapy is the base treatment for venous ulcers (Juutilainen & Hietanen 2013, 285.)

Restoring the skin integrity is crucial, because the skin is extremely fragile and the risk of injuries and infections is increased. One way to protect the skin is to keep the legs clean, soft and dry. The patient should be taught how to take care of his legs by keeping them moisturised. Basic lotion can be used to moisturise the skin. Eczematous skin is treated with cortisone cream prescribed by a doctor. Venous ulcers can secrete a great deal because of oedema. The skin around the ulcer should be protected from the wound secretion by keeping the skin clean and dry. Different wound dressings can be used to cover the ulcer. Dressings should be changed when needed. (Juutilainen & Hietanen 2013, 289.)

The patient is advised to stop smoking, because nicotine is a vasoconstrictor, which affects the circulation by narrowing the veins. The healing process slows down if the patient continues smoking (Iwuji 2008, 18.)

Proper nutrition aids the healing process of ulcers. The diet should be diverse and include carbohydrates, vitamins and minerals. A sufficient protein intake is crucial, because protein deficiency is associated with delayed healing of ulcers. In addition, the ulcer exposes the patient to malnourishment, because nutrients are lost with wound secretion (Current Care Guidelines 2014.)

### **3.3 Oedema**

Oedema starts to develop when there is an imbalance of fluid exchange in the limbs. As this happens, fluid starts to accumulate in tissues, ultimately appearing as oedema. Literature usually discusses two different oedemas, lymphoedema and chronic oedema. (Cooper 2013, 134.) It is easy to become confused between these two types, so next we will shortly discuss both terms.

### **3.3.1 Lymphoedema**

Lymphoedema is a progressive condition, where lymph fluid accumulates in tissue space (Cooper, 2013, 134). Lymph fluid contains proteins and it is filtered out from vessels into different tissues. Normally, the fluid runs to the lymph nodes via lymph vessels. The circulation of lymph fluid can be interrupted due to several reasons, and as this interruption happens, lymphoedema starts to develop. Common causes of lymphoedema can be divided into primary and secondary causes: primary causes are congenital and secondary causes are caused by external factors, such as radiation therapy (Juutilainen & Hietanen 2013, 292.) Lymphoedema is a form of chronic oedema, which cannot be cured (Todd 2013, 623).

### **3.3.2 Chronic oedema**

Chronic oedema refers to oedema that has been present for three months or longer. There are many conditions, which can cause chronic oedema, such as heart failure, immobility and venous insufficiency (Cooper, 2013, 134.) Chronic oedema often appears in the lower limbs. Due to oedema, mobility problems can arise, since the size and the weight of the legs is increased. This is unprofitable for the patient, since immobility is one of the factors, which increases oedema (Todd 2013, 623.) This thesis focuses on venous insufficiency and chronic oedema caused by it.

## **3.4 Compression therapy**

Compression therapy is a non-invasive method to reduce oedema in the lower extremities. Compression therapy should create compression which is greater in the lower part of the limb and gradually reduces towards the knee (Juutilainen & Hietanen, 2013, 285.) The therapeutic effect consists of the reduction of oedema in the lower extremities and improving the venous flow towards the heart (Moffat et al. 2009, 386, 387). The effect is based on the physiological effects of the compression: reduction of capillary filtration, increasing lymphatic drainage, and improving venous pump action (Cooper 2013, 134, 136.) Compression therapy is an essential part in the management of a venous disease and the healing process of an ulcer (Anderson 2008, 55). It can be

executed by using compression bandages, compression hosiery or intermittent compression therapy (Anderson 2006, 225.) In this thesis, we focus on compression bandages.

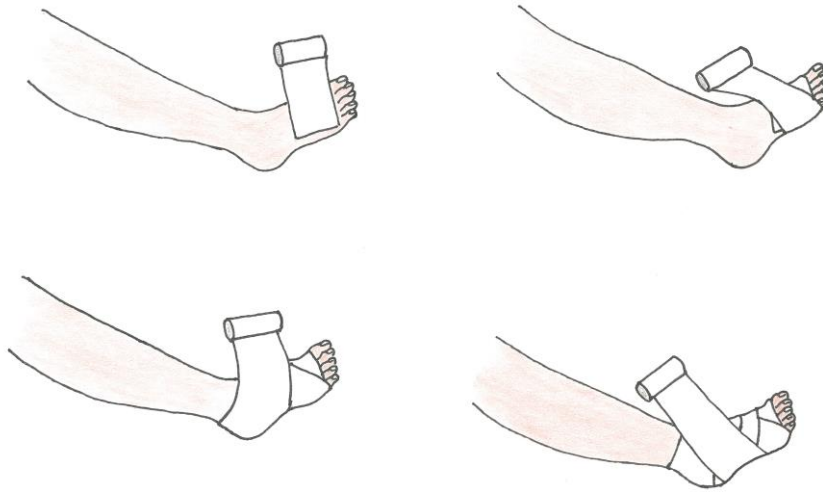
### **3.4.1 Compression bandages**

Compression bandages can be either elastic or inelastic. Elastic bandages should be used with patients who are immobile, whereas inelastic bandages are meant for patients who are able to move normally. The elasticity of the bandage material has a different kind of effect on managing the oedema and the risen venous pressure. Elastic bandages do not create as great a pressure on the calf muscle as the inelastic ones. The elastic bandages need to be taken off for the night, whereas the inelastic bandages do not need to be taken off; in fact, they can be worn for multiple days. (Juutilainen & Hietanen, 2013, 286.)

### **3.4.2 Bandaging techniques**

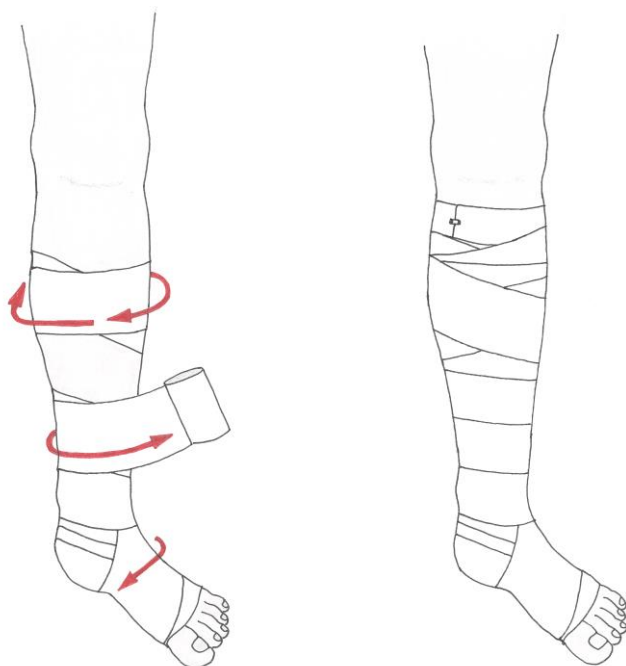
There are different techniques to apply bandages, such as the spiral, figure of eight, and anatomical technique (Juutilainen & Hietanen 2013, 286-287.) In this thesis, we concentrate on the anatomical technique.

The anatomical application technique utilises inelastic bandages and follows the shape of the leg. The bandage should be kept tight when applying it, but not so tight that it will bring discomfort to the patient. Two rolls of inelastic bandage are needed for one leg; one bandage roll should be wider than the other. Applying the bandage starts with the narrower bandage roll beginning from the root of the toes from where it goes towards the ankle and up towards the knee. Problems can arise when applying the bandage on the heel area. The ankle should be tilted to a neutral 90 degree angle. This can create a challenging shape for applying the bandage as the whole ankle area should be covered. (Juutilainen & Hietanen 2013, 286-287.) Picture 1 on the next page depicts the steps of bandaging the heel area.



PICTURE 1. Bandaging the ankle with the anatomical application technique. (Modified from Juutilainen & Hietanen 2013, 287).

After covering the ankle area, one continues to apply the bandage according to the natural shape of the leg, going up towards the knee and coming down towards the ankle again if needed, but not going to the foot level anymore. Once the roll finishes, the end of it is attached to the bandage with a tape. Applying the wider bandage roll begins from the ankle. The same principle exists: to follow the natural shape of the leg by allowing the bandage to go up and down. It should be made sure that all the gaps left when bandaging with the first roll are covered. Additionally, there should be at least four centimetres of space between the bandaging and the knee, so that it is easy to bend the knee (Juutilainen & Hietanen 2013, 286-287.) The bandaging style is depicted in picture 2 on the next page.



PICTURE 2. Bandaging the leg with the anatomical application technique. (Modified from Juutilainen & Hietanen 2013, 287).

### 3.5 Patient adherence

Compliance, adherence and concordance are terms, which can be easily mixed. These three terms describe almost the same matter, but there is a small difference (Savikko & Pitkälä 2006.) According to the World Health Organization (2003, 18), the main difference between compliance and adherence is that adherence requires the patient's agreement to the recommendations. The World Health Organization defines adherence as "the extent to which a person's behaviour – taking medication, following a diet and/or executing lifestyle changes, corresponds with agreed recommendations from a healthcare provider." Compliance is an older term, which describes a situation, where the patient obediently follows the instructions given by the healthcare professional without having an active role in planning. Concordance as a term is quite close to adherence, but it does not emphasise the active role of the patient. The term adherence is used increasingly nowadays to describe the patient's commitment to care. This can be seen as a positive matter, because the patient is more involved in the decision. Unfortunately however, adherence is not a constant state. It is dependent on various internal and external factors, which are presented in table 4 below (Savikko & Pitkälä 2006.)

TABLE 4. Factors related to patient adherence. (Savikko &amp; Pitkälä 2006).

Internal factors	External factors
Cognitive factors: - memory - understanding - practical skills - sensory deficits	Factors related to care: - duration of care - benefits versus disadvantages - possible side effects - previous experiences - continuity of care - goals of care
Personal factors: - self-esteem - motivation	Factors related to healthcare professionals: - trust on the professionalism of the personnel - received information about disease - experienced interaction with the personnel - listening, humour, encouragement - style of approach - lack of resources
Attitude towards life: - hopefulness - motivation	Support of social network: - support of close ones - encouragement - peer support - culture - stereotypes
Beliefs, values and attitudes: - acceptance of the new life situation	
Fear: - fear of death - fear of sickness and disability - fear of stigmatisation	
Factors related to disease: - symptoms	

<ul style="list-style-type: none"> <li>- severity of the disease</li> <li>- other diseases</li> <li>- acute versus chronic disease</li> </ul>	
<p>Empowerment:</p> <ul style="list-style-type: none"> <li>- autonomy</li> </ul>	

### 3.5.1 Factors related to non-adherence

Venous insufficiency is a chronic condition, which requires lifestyle modifications in order for the symptoms to be managed. Patients are asked to wear compression garments, exercise, and elevate their legs regularly. Compression therapy has been shown to be effective in the management of venous insufficiency and thus it is the first preventive strategy recommended to patients with chronic venous ulcers. However, some patients have problems with compression garments. Patients may find them uncomfortable, costly and difficult to apply, which can lead to low adherence (Finlayson et al. 2014, 91-92.) Physical symptoms, such as pain, skin irritation, and difficulty of applying bandages also have a negative influence on patient adherence. Pain can also occur if the chosen compression garment is inappropriate or if the compression bandages are applied incorrectly, for example too tightly. (Moffat et al. 2009, 387-388.)

The patient's adherence to compression therapy is better when the compression is moderate rather than high. The patient's feelings and experiences should be taken into consideration when applying the bandages; the pressure should be on a level that the patient can cope with and no pain or discomfort should be experienced. There is a device that can be used to measure the compression pressure. Plastic air-filled sensors are placed above the medial malleolus and on the thickest part of the calf before applying the compression bandages. The sensors are then attached to the measuring device with a plastic line. After the bandages are in place, the compression pressure can be measured. By using this device the compression pressure can be maintained on the same level throughout the compression treatment (Juutilainen & Hietanen 2013, 286.) However, devices of this kind mostly exist in outpatient clinic settings, so it is always

important to ask the patient if there is too much or too little compression and explain why it is important that the compression is on a sufficient level.

Various issues in daily living may lead to non-adherence, such as aesthetic and cosmetic issues. For example, the patient may find him/herself unattractive, because of the compression bandages. The patient may be unable to wear his/her normal clothes and shoes. (Moffat et al. 2009, 387-388.) The patient's conception of the unattractiveness of compression bandages can also decrease the patient's will to exercise. Exercising would be beneficial, since it keeps the calf muscles in good shape and increases lower-limb circulation. Some patients may have a job, which requires standing for long periods of time without the possibility of lifting the legs. (Bainbridge 2013, 36.) It has been identified that people who are depressed or at risk of depression have lower levels of self-care and adherence to chronic disease management. Other physical conditions that the patient may also have impact on the adherence to the treatment. The reasons behind this can for example be physical restrictions. (Finlayson et al. 2014, 94-95.)

### **3.5.2 How to promote patient adherence**

When introducing the patient to compression therapy, it is essential to explain the reasons for the treatment, such as how it works and why it is important. In order to promote the patient's understanding, these factors should be explained in layman's terms and the information should be introduced gradually, instead of overloading the patient with all information at once. Before teaching the patient more about compression therapy, it should be made sure that the patient has understood the information told before (Brown 2001, 538.)

According to Bainbridge (2013, 38), patients' adherence towards treatment is low if they do not understand the reason and have knowledge about their disease. Lack of trust and communication problems with healthcare professionals also have a negative effect on patient adherence. A trustworthy relationship between the healthcare professional and the patient should be pursued in order to promote adherence towards the treatment. This is especially important if the patient has negative experiences with healthcare professionals or compression therapy (Bainbridge 2013, 36.) Teaching the patients about their disease and treatment should continue throughout the compression therapy,



but it should later on concentrate on reinforcing the patients' understanding of why the continuity of the treatment is crucial (Brown 2001, 538). There is plenty of complexity regarding patient adherence. Some studies suggest that providing information in various ways, such as written and verbal, reinforce adherence. However, other studies have shown that regardless of teaching material, some patients are not interested in patient education material. This is why it is important to provide the information in such a way that is suitable with the patient's requirements and is up to date with the progress and the possible changes of the patient's condition (Bainbridge 2013, 38.)

### **3.6 Written patient education material**

Patient education is important, since many positive outcomes can be reached with it. Patient education improves knowledge, satisfaction, adherence to treatment, and self-management. Patient education also gives the patient a more active role and enhances his/her capability to make informed decisions. Healthcare professionals tend to educate their patients verbally, but it is recommended that written material should be used to reinforce the given information (Hoffmann & Worrall 2004, 1166.) Use of written material is rational in situations, where there is limited time to spend on patient education (Kyngäs, Kääriäinen, Poskiparta, Johansson, Hirvonen & Renfors 2007, 124.)

Written material has a positive impact on the effectiveness of patient education, since the patient can go back to the material and refresh his/her memory. The patient can forget information which was verbally given during the hospital stay. The patient might also come up with questions, which arise after seeing the healthcare professional. In that case, written material helps the patient to obtain answers to his/her questions. Written material has many advantages. First of all, the message is consistent and the material is reusable. It is also economical to produce and update. It can be easily delivered and the patient can use it for self-studying. (Hoffmann & Worrall 2004, 1166.)

When making material for patient education, several features must be considered. These features can be grouped into the following categories: content, language, organisation, layout, typography, illustration, cover, learning, and motivation. (Hoffmann & Worrall 2004, 1166.)

The purpose of written material must be clear to the reader, because he/she might not pay attention to the material, if he/she does not know its purpose (Hoffmann & Worrall 2004, 1166.) The purpose of written material can be clarified with concrete examples and descriptions (Kyngäs et. al 2007, 126). The material should include a moderate amount of information and this information should be targeted to answer the needs of the target group. The content of the written material should be accurate. This can be achieved by using reliable references while making the material. The material should also be reviewed and updated on a regular basis. (Hoffmann & Worrall 2004, 1167).

According to the studies, the language used in written education material should be culturally appropriate and non-judgmental. The language should also be simple enough, so that even people with limited reading skills are able to understand the content. The readability of the written material can be enhanced by using short sentences and common words. The use of medical jargon should be avoided if possible, but sometimes it is necessary to use medical terms in order to give accurate information. In this case, the terms should be explained to the patient. (Hoffmann & Worrall 2004, 1168.)

The order of contents of the written material should be well-thought. The information considered to be the most important or useful to the patient should be presented first. Subheadings should be used when organising the content. They should summarise the main points of the material, since many readers will only read the main heading and subheadings in the material. (Hoffmann & Worrall 2004, 1168.)

The layout of the written material should be clear. The content of the material should be organised into clear, succinct sections. It is recommended that a minimum font size of 12 point is used in order to make the text readable. Dark print should be used, since it maximises the colour contrast between the ink and the paper. The use of illustration in the written material can improve the reader's understanding. However, the illustration used must be related to the content and have a written explanation below each illustration (Hoffmann & Worrall 2004, 1169.)

## 4 METHODOLOGY

In this section, we describe the process of writing a Bachelor's thesis. The process includes several steps, starting from planning. Good planning enables a smoother writing process. In addition to good planning, information search must be conducted in order to write a thesis which is trustworthy and research-based. As a result of these steps, a functional thesis with a product is formed.

### 4.1 Planning

Writing a Bachelor's thesis is a process which has several steps. The process starts from choosing a topic for the thesis. The student should choose a topic, which he/she finds interesting. The topic should be related to his/her field of studies, giving the student a chance to develop an expertise in some area of the field. (Vilkka & Airaksinen 2003, 16.)

From the beginning of the Bachelor's thesis process, it was clear to us that we wanted to make a functional thesis with a product. We had an idea of making material for patient education, but we were not sure about the exact topic. Luckily, our teacher helped us to find a working life connection, which was the Pirkanmaa Hospital District. They gave us an interesting topic, which we both liked. They had a need for patient guidance material, which would include general information about compression bandages and photographs, which would describe the process of applying the bandages.

The next step of the Bachelor's thesis process is to create an action plan. The action plan includes all the crucial information about the thesis, summarised in a few pages. The main purpose of the action plan is to clarify the process of the Bachelor's thesis and plan the implementation of the actual thesis and the product. The student should figure out the suitable target group for the product and familiarise him/herself with the literature. The action plan should also include a timetable for the Bachelor's thesis process. (Vilkka & Airaksinen 2003, 26, 27.)

We started to collect information for our five-page plan in autumn 2013. Our plan was written according to the guidelines given by Tampere University of Applied Sciences. In the plan, we introduced our topic shortly. We also introduced our working life connection and defined our target group. In the plan, we planned our Bachelor's thesis process and made a schedule for it. It was accepted by our teacher tutor in January 2014, after which we applied for permission from the Pirkanmaa Hospital District to proceed with our thesis.

A functional thesis is an alternative for the more traditional type of thesis. A functional thesis consists of two parts: the report and the product. The report part has two tasks. Firstly, it defines the theory base for the actual product. Secondly, it describes what has been done and why, giving the student a chance to justify his/her actions regarding the thesis and the product. The product is the second part of the functional thesis. The product can be almost of any kind, but usually it is a written one, like a portfolio or a booklet. (Vilkka & Airaksinen 2003, 9, 65.)

The section on theoretical starting points forms a base for our report section. In the section, we answer our study questions and describe the theoretical background for our product. Our product is meant for educational purposes, and it is patient guidance material on compression bandaging. It is meant for patients, who suffer from venous insufficiency and oedema caused by it. The caregivers of these patients are also taken into consideration, since we found out from the literature studied that many patients with venous insufficiency are dependent on help from other people (Regmi & Regmi 2012, 62).

## **4.2 Literature review**

In order to collect information for the theoretical part, the student must perform a literature review. A literature review is a method for the researcher to gain knowledge and information about the topic. It gives a steady base for the researcher to build new evidence on. A literature review consists of several steps which all need to be carefully conducted. (Polit & Beck 2012, 58, 94.)

The first step of a literature review is to create a study question, which will guide the information search. The second step is to create a search strategy. One must investigate what kind of information there is available about the topic. (Polit & Beck 2012, 108.)

We formed four study questions and introduced them in section two “Purpose, Tasks and Objectives”. In order to find answers to our questions, we created keywords that we used while searching for information. Our main keywords were venous insufficiency, venous ulcer, oedema, compression bandages, patient adherence, and patient education. We used these keywords individually and in different combinations.

For the information search, we used databases suggested by Polit and Beck (2012), such as CINAHL. We also used other databases, such as Terveyskirjasto, Current Care Guidelines, and the National Health Service, since they are considered reliable sources. These databases provide information, which is regularly reviewed and updated. They are also used by healthcare professionals. The World Health Organisation is globally considered a trustworthy organisation and therefore we also used their web pages.

We used limitations to narrow down our information search. We accepted only peer-reviewed, full text articles from years 2000-2014, and sorted out the articles by reading their abstracts. We included articles which we found interesting, reliable and related to our topic and excluded articles which were not content-wise related to our topic.

We also used some books as our sources, because we were able to find good basic information from them. The books that we mainly used were *Toiminnallinen Opinnäytetyö* by Vilkkä and Airaksinen, *Haavanhoidon Periaatteet* by Juutilainen and Hietanen, and *Nursing Research* by Polit and Beck.

According to Polit and Beck (2012) a study needs to have reliability and validity for it to be truthful and unbiased. The reliability of the study ensures that the information in it is accurate and consistent, and the validity of the study guarantees that the information is truthful and sound (Polit & Beck 2012, 174, 175). To ensure these features in our thesis, we checked the merits and professions of the authors and read many articles to gain knowledge of information in different articles that is consistent and thereby also more truthful.

### 4.3 Creating a product

The aim of a functional thesis is to create a product. The student should decide a suitable form for the product in order to reach the target group. In addition to the form, the student should figure out several things concerning the product, such as size, the typography of the text, the style of the text, and so forth. The product should be unique and stand out from other similar products. If the student has a working life connection, he/she must follow the instructions given by it. The student must be critical with the sources, especially when making material for educational purposes. The student must be able to define from where he/she has collected the information and how he/she has verified the validity of the information. (Vilkka & Airaksinen 2003, 51, 53.)

In this thesis, the process of creating a product started with having a meeting with our working life connection. In the meeting, we discussed the wishes and expectations of the working life connection, but also ideas that we had regarding the product. Our working life connection had a clear view about the product. There was already one patient education leaflet in use, but it was not satisfactory. The working life connection wished that we would create a new leaflet, which not only included general information about compression therapy and bandages, but also photographs, which would depict the steps of applying the bandages.

As neither one of us had plenty of experience in photography, it took a great deal of time for us to figure out the details concerning the photography session for the pictures in our product. We had to pay attention to basic things in photography, such as lighting and background, but also consider what kind of pictures would be most informative and clear. We also searched for other bandaging guides with photographs to see which factors make the pictures clear and which steps of the bandaging process would be crucial to photograph. Since the first photography session resulted in pictures that were slightly unclear, we decided to make a careful plan for the next session.

Our working life connection, the Pirkanmaa Hospital District, has strict guidelines concerning patient education material. These guidelines set some limitations for us, but also guided our work while making the product. Our product is based on the previous leaflet that our working life connection had, but we rewrote it and added more information to it. Our text is based on the information that we gathered during the literature review. While writing, we used current information from peer-reviewed articles in order to enhance the reliability and the validity of our product. We maintained some text from the old leaflet, for example the headings. We wanted to make the product more informative, but at the same time we did not want to make too radical changes to the content, since the previous leaflet already included good basic information about compression therapy.

The style of our leaflet is based on the guidelines given by our working life connection. They wanted to keep the style of the product simple and the amount of text moderate. In the meeting with them, we agreed that the product will consist of two A4 size pages. The first page includes general information about compression therapy and the contact information of our working life connection. The second page has a set of photographs, and below each photograph, there is an explanation of the particular step. While writing, we tried to keep our text reader-friendly by using layman's terms, since our target group consists of patients. In order to make our product clear and easy to read, we concentrated on details, such as the style of the font and the composition of the text and photographs.

We chose to make the leaflet in electronic form, because it can then be easily updated and printed out, if needed. We agreed with our working life connection that it will be responsible of possible updates.

## 5 DISCUSSION

In this section, we discuss the ethical considerations, trustworthiness and limitations of our Bachelor's thesis, in order to enhance the trustworthiness of our research. We also reflect on our experiences of the entire process of our Bachelor's thesis and set some recommendations for further studies.

### 5.1 Ethical considerations

Research ethics are guided by legislation, norms and different national and local advisory boards in order to guarantee the trustworthiness. (Leino-Kilpi & Välimäki, 2012, 362-363.) In Finland, the Ministry of Education and Culture has appointed the Finnish Advisory Board on Research Integrity. The mission of the board is to promote responsible conduct of research, and to spread information on research integrity in Finland. They also monitor the international developments of research integrity. Their responsible conduct of research guidelines state that the values guiding the process of research are accuracy, meticulousness and integrity. (Finnish Advisory Board on Research Integrity 2014.)

The Finnish Nurse Association has set Ethical Guidelines for Nursing, which provides support and guidelines for everyday ethical dilemmas in the field of nursing. The product of our thesis is patient guidance material, which the healthcare professional presents to the patient. It is important to acknowledge the individuality of care, and emphasise self-determination and the right of the patient to participate in the decision-making regarding his/her own well-being when guiding the patient (The Finnish Nurse Association 1996). In our thesis, we have pointed out the importance of patient adherence in order to give the patient an active role in his/her care.

Before starting the research, a permit needs to be acquired (Finnish Advisory Board on Research Integrity 2014). We wrote our five-page plan to represent our future thesis, and sent it to our working life connection along with a permit application. Once we had their written permission, we began the actual writing process. Our working life connection also has an ethics committee.



The product of our Bachelor's thesis is patient guidance material, which consists of pictures and text. To avoid copyright issues, we chose to take the photographs ourselves. As a reference, we used many different patient guidance materials concerning compression therapy, and made a plan based on them. We have included some drawn pictures in the thesis too, but due to the mentioned copyright issues, decided to draw them ourselves. As a reference for the drawn pictures, we used pictures from the textbook *Haavanhoidon periaatteet* (2013) written by Juutilainen and Hietanen.

Financial sources should be announced to all members of the research project and reported in the results of the research (Finnish Advisory Board on Research Integrity 2014.) In this thesis, all financial costs were covered by the authors.

## **5.2 Trustworthiness**

Trustworthiness is a term, which is used especially in qualitative research. Trustworthiness describes the degree of confidence that the researchers have in their data. Reliability refers to the accuracy and consistency of information, which is obtained through research. Validity describes the degree of measurability. This means that the research project is valid if its methods measure what they are supposed to measure. (Polit & Beck 2012, 175.)

Our Bachelor's thesis is a functional thesis with a product. We did not conduct a study ourselves, but our thesis is based on a literature review. Our theoretical framework is based on existing research articles and literature. A great emphasis is placed on the trustworthiness and reliability of the used information, since we are producing material for patient guidance.

According to the literature, the student should think critically when choosing information for a thesis. Some topics can be studied widely and there can be contradictory study results. In order to gather reliable information, the student must familiarise himself with already existing literature. The student can then see what kind of information there is available. (Vilkka & Airaksinen 2003, 72.)

The student should use articles which are written by well-known authors. The author can be considered an expert in his/her field, if he/she is mentioned in several publications and his/her articles are widely used as references. Besides choosing articles from well-known authors, the student should use articles which have been published recently. (Vilkka & Airaksinen 2003, 72-73.)

In order to gather information for our thesis, we conducted a literature review. We read through several articles, since we wanted to know what kind of information is sustainable and appears regularly in the articles. While searching for information, we used inclusion and exclusion criteria. By using these limitations, we were able to gather articles, which have been recently published and peer-reviewed. Since we ended up having several articles, we went through them all by reading the abstracts. While reading the articles, we used critical thinking. We chose to use articles which were written by well-known authors and seemed content-wise reliable and related to our topic.

According to the literature, the student should not use textbooks and manuals as references. Information used in books becomes easily outdated, since the research is continuously developing (Vilkka & Airaksinen 2003, 74).

We ended up using some information from textbooks, even though it is not recommended. We are aware that this could create a problem, when considering the reliability of our thesis. However, some of the books included information, which could not be found in articles, and therefore we decided to use that information. *Toiminnallinen opinnäytetyö* (2003) by Vilkka and Airaksinen is a good example, since it is considered to be one of the few books, which focuses on the process of writing a functional thesis. Certain books were recommended to us by our teachers, since those books are generally considered reliable. For example, *Haavanhoidon periaatteet* (2013) by Juutilainen and Hietanen is recently published and it is also used by healthcare professionals.

Plagiarism is copying someone else's ideas and thoughts. It is forbidden and against the ethical rules of research. Each source must be marked down clearly in the text and the student must present information as it is in the original source. (Vilkka & Airaksinen 2003, 70, 78.)

In order to avoid plagiarism, we used paraphrasing while writing. We tried to avoid using straight citations from the sources. However, we ended up having one from the World Health Organization, since it was very descriptive. We carefully marked down the sources in order to enhance the reliability of our thesis. We presented information truthfully, accurately and without modifying it.

### **5.3 Limitations**

There are some limitations in our Bachelor's thesis. Firstly, we concentrate on compression bandages instead of other compression garments. This was a conscious decision, but we are aware that this gives a narrower picture of compression therapy. Secondly, our working life connection set strict guidelines concerning the product. We are satisfied with the product, but due to limited space, we were unable to include all the information that we would have wanted to. Finally, we were unable to find extensive information on chronic oedema in the literature. Lymphoedema as a topic is more researched, whereas there is not much research on chronic oedema.

### **5.4 Reflection of Bachelor's thesis process**

We both wished to make the Bachelor's thesis with a partner, and since we shared the same kind of interests regarding the thesis, we decided to do it together. We mostly wrote the thesis individually, but since we wrote on Google Drive, we could always see what the other one had written in real time. We also met each other on a regular basis to have meetings and discussions about the Bachelor's thesis and its progress. Our co-operation was smooth and we went through the text together to modify it and make it consistent in style.

We had a few meetings with our working life connection, during which we gained knowledge on their needs and wishes regarding the product. Sometimes there were slight difficulties to get in touch with our working life connection due to human communication problems. Regardless of that, we feel that we received good feedback and support from our working life connection during this process.

It was very beneficial to have many meetings with our teacher tutor during the thesis process, because we received constructive feedback and tips from her. Our teacher tutor was changed during the Bachelor's thesis process because of reasons that were not due to us. This change did not interrupt the progress of our work or the continuation of good guidance.

At the university, we regularly had Bachelor's thesis seminars, in which we presented our thesis and asked for suggestions on how to improve our thesis. We had specifically appointed opponents who read our work, so they were able to give good feedback on our writing and about the contents. During the seminars, our teachers, opponents and fellow students gave us feedback and tips concerning some practicalities of the thesis. It was important for us to receive peer support from fellow students.

During the Bachelor's thesis process, we both gained a great deal of new knowledge about venous insufficiency and oedema. We also acquired new skills: we both learned how to utilise the anatomical application technique with compression bandages. In addition, our knowledge about scientific writing and research improved.

Our aim was to produce patient guidance material, which will promote patient adherence towards the use of compression bandages and enhance the outcomes of compression therapy. We hope our product will help our working life connection with patient guidance. We hope that our material helps patients gain a better understanding of the reasons for their care and ultimately promotes health and wellbeing.

## **5.5 Recommendations**

A research concerning healthcare professionals' knowledge of compression therapy in various healthcare settings would be beneficial in order to identify information gaps and differing styles in care. Gathering more information about patients' experiences and patient education regarding compression therapy would also be beneficial. This could help with developing more efficient patient education material and promote patient adherence.

## 6 CONCLUSION

Our aim was to produce clear and informative patient guidance material for the Pirkanmaa Hospital District. Our material includes information on compression therapy, which is the most important treatment method with lower extremity oedema. Patients' adherence to compression therapy is essential, because it is associated with better outcomes of the care. According to several studies, patient adherence can be promoted with written patient guidance material. Our material is beneficial for patients and their caregivers, because it aims to enhance the self-care and management of lower extremity oedema. Healthcare professionals can also use this material for guidance purposes.

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