

Taking the lymphatic system into consideration in nursing

How lymphedema impacts the breast cancer patients' quality
of life

Tiina Haapiainen

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<p>Abstract:</p> <p>The lymphatic system has several vital functions to maintain a healthy immune system. Breast cancer-related lymphedema is a non-curable condition that refers to post-surgical chronic and painful swelling of the upper limb. The aim of this study was to review existing literature to see what information is available for nurses about the importance of the lymphatic system. The study focused on breast cancer related lymphedema patients and two research questions were asked 1) What are some of the effects on quality of life that breast cancer-related lymphedema patients' experience? and 2) How should nurses take the lymphatic system into consideration in practice? The literature review was conducted through the theoretical concept of 'Quality of life' (QoL), also 'Health-related Quality of life' (HRQoL). Ten articles were analyzed by using an inductive analysis approach. The reviewed literature supports the hypothesis that women with breast cancer-related lymphedema report poorer quality of life than breast cancer survivors without it and that health care personnel often fail to offer systematic and adequate pre- and post- patient education to breast cancer patients. Further studies should be conducted whether including lymph related studies in nursing curriculum would benefit nurses' ability to deliver more systematic patient education to breast cancer patients.</p>	
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<p>Tiivistelmä: Lymfajärjestelmän tehtävänä on ylläpitää eri toimintojen kautta kehon immuunijärjestelmää. Rintasyövän jälkeen kehittynyt lymfaödeema on parantumaton ja kivulias tila, jossa yläraaja turpoaa kroonisesti kainalon imusolmukkeiden poiston seurauksena. Tämän työn tarkoituksena oli tutkia mitä tietoa nykykirjallisuus tarjoaa sairaanhoitajille lymfajärjestelmän tärkeydestä. Aihetta rajattiin koskemaan ainoastaan rintasyövän jälkeisen lymfaödeeman sairastavia naispotilaita ja tutkimuskysymyksiä olivat 1) Minkälaisia elämänlaatuun vaikuttavia vaikutuksia lymfaödeemaa sairastavat rintasyöpäpotilaat kokevat? ja 2) Miten sairaanhoitajien tulisi huomioida lymfajärjestelmä käytännön työssä? Viitekehystenä tässä kirjallisuuskatsauksessa käytettiin käsitteitä ‘Quality of life’ (QoL), elämänlaatu tai ‘Health-related Quality of life’ (HRQoL) – Terveysteen liittyvä elämänlaatu. Kirjallisuuskatsauksessa analysoitiin kymmenen tutkimusta induktiivisen päättelyn avulla. Tutkimuksissa on havaittu, että rintasyöpäpotilaat, joilla on lymfaödeema kokevat elämänlaadun heikommaksi, kuin ne, joille sitä ei kehity, eikä terveydenhuoltohenkilökunta onnistu aina tarjoamaan systemaattista ja asianmukaista esi- ja jälkiohjausta rintasyöpäpotilaille. Kirjallisuuskatsauksen pohjalta voidaan sanoa, että lymfajärjestelmällä on vaikutusta elämänlaatuun vaikuttaviin tekijöihin. Tulisikin tutkia miten lymfakoulutuksen lisääminen parantaisi sairaanhoitajien taitoja antaa järjestelmällistä potilasohjausta rintasyöpäpotilaille.</p>	
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1 FOREWORD

I have wished to have an opportunity to write (and talk) about the importance of the lymphatic system ever since I started learning what role it plays in healing and achieving holistic health. I am hoping to develop deeper professional knowledge and skills to be able to write and eventually educate more on the matter in the years to come. I am grateful that Arcada has allowed me to use this platform to kick-start my project.

I wish to thank Teresa Sepponen from Terveysklinikka Pisara who has patiently educated me and passed her knowledge to me during the past 6 years. I am thankful for your friendship and mentoring.

My writing would have never happened without the tutoring and caring I received from Tommi Lindholm and the support and perspective I got from the conversations with my dear friend Jani Toivola. I love you both! My most amazing driving force has been my daughter who was born during the writing process. Despite the fact that I am going through a stage of chronic sleep deprivation she has succeeded to motivate me to continue working by showing me the purest form of love and acceptance.

Tiina Haapiainen

Helsinki April 20th, 2015

2 INTRODUCTION

In 2013 breast cancer diagnosis was given to 4808 women in Finland (Yleisimmät Syövät, Syöpärekisteri). Imagine being one of the diagnosed women and having gone through painful months or years of cancer treatments and uncomfortable side effects and trying to adapt to the changes in your body. Imagine that you are finally starting to recover and dare to dream about a new and healthy beginning. You are waiting and hoping to be confirmed “cancer-free” some time in the future. Imagine that because of the unexpected new symptoms you are suddenly experiencing you start fearing that *the cancer is back*. After too many sleepless nights and visits at the doctor you find out that what you thought was cancer, breast inflammation or “normal” post-treatment swelling and pain, is actually a condition called elephant disease, elephantiasis or lymphedema.

Nobody warned you that being cancer free does not necessarily mean that you are healthy. Nobody told you that having your lymph nodes removed might lead to a painful and visible condition that can be treated but not completely cured. Nobody told you that your limbs would be compared to those of an elephant. Nobody told you that if you had started adequate prevention measures after receiving the cancer diagnosis, the symptoms of lymphedema could have been radically decreased and controlled.

The initial motivation for this literature review was to question for how long are we going to continue underestimating the lymphatic system’s role in health and healing? Despite the medical “evidence” and the fact the lymphatic system has been recognized as a vital structure for holistic health since Before Common Era, the literature review showed that cancer lymphedema patients report a decrease in their quality of life and health care personnel, including nurses, lack the skills to offer adequate patient information regarding lymphedema. Choi et al. point out that considering how essential the lymphatic system is for our health, and how little knowledge we actually have about it, the lymphatic research is “truly a gold mine that invited ambitious young scientist and clinicians” (2012 p.15)

3 BACKGROUND

I have been working as a lymphatic drainage therapist at a private holistic health clinic in Helsinki. The customers I have had the privilege to meet during these years have been the inspiration for this study. Most of the breast cancer survivors and other surgical patients, whose therapist I have been, reported that they had received no, or very little information on the lymphatic drainage therapy. The health care personnel failed to educate them on the benefits of the lymphatic drainage in cases and conditions where it should be clear how beneficial the therapy would be for healing. This seemed surprising to me especially when the fact that in Finland the physicians can write referrals for lymphatic drainage therapy for patients suffering from lymphedema is taken into consideration. The refund is applied from using the form SV 3 FS, *Selvitys annetusta fysioterapiasta*. (Kela, sairaanhoitokorvauksen hakeminen)

Finally after starting my studies as a nursing student at Arcada Polytechnic, I noticed that the students' curriculum does not contain any education related to the lymphatic system (Arcada Nursing 2012 curriculum). This was another surprise since it is clear that the information exists in the research, but for some reason it does not reach the nurses and nursing students. Without educating nurses they will not be able to detect even simple lymph-related conditions, which in turn might result in poorer patient education. These thoughts are backed up by studies that show that the lymphedema patients do not receive enough information on self-care from health care professional although breast cancer survivors suffering from lymphedema report a poorer quality of life (Ridner, Dietrich & Kidd 2011, Ridner 2006).

I believe that taking care of the lymphatic system is essential for maintaining holistic health and since the matter is not covered in our nursing studies I decided to dip into a huge topic in order to offer at least one example why it should be included in all nursing curriculums

Terveysklinikka Pisara located in Helsinki, Finland has commissioned this study. Among other treatments and consultation services, Pisara offers different massage and

lymphatic therapies including both manual and mechanic lymphatic drainage. Customers range from healthy individuals to cancer patients and pre- and post-surgical patients.

3.1 Previous research

This study is a literature review analyzing ten articles of previous studies regarding breast cancer related lymphedema and quality of life. As shown in the literature matrix (appendix 1) most of the reviewed articles literature reviews or quantitative studies. All the reviewed articles were international and with closer analysis it became clear that the original sources were often linked to same root studies. That could indicate a lack of research material. Only a handful of information was found in Finnish to offer background material.

There was a sufficient amount of research material to conduct a narrow review regarding lymphedema and quality of life but again, for a more ambitious study, it would not have been enough as results and conclusions seemed to repeat themselves without any research taking the next step for further studies or practical implications.

I did not find research regarding the lymphatic system and nursing studies, and in general it can be said that the research material regarding lymphedema and educating it to nurses is nearly non-existent. Finnish research regarding breast cancer related lymphedema seems to be scarce as all the research sources are again international. However I found two Finnish nursing theses that I believe are worth mentioning as they present the fact that some nursing students are familiar with lymphedema or believe that there is need for systematic lymphedema instructions in the nursing field.

One of the studies is by nursing students at Metropolia University of Applied Sciences. The name of the thesis is *Lymfäödeemapotilaan verenpaineen mittaaminen – Instructions on how to measure lymphedema patient's blood pressure* (Heino, Hietanen, Kokko 2012). The brochure includes both pictures and written instructions and is intended for health care personnel and lymphedema support groups.

The other thesis is written by nursing students at the Laurea University of Applied Sciences in Porvoo: *Rintasyöpäleikkauksen jälkeisen lymfaödeeman oireet ja hoito - Symptoms and Treatment of Post-breast Cancer Operation Lymphedema* (Riñon & Ruuhiala 2014). The thesis is a literature review explaining the symptoms and treatment for breast cancer related lymphedema.

In general it could be said that based on the lymphedema research, there seems to be a need for practical instructions and implications that need to be conducted among health care personnel. In addition to that Finnish research material is urgently needed.

3.2 Breast cancer in Finland

Breast cancer is the cancer characterized by the growth of malignant cells in the mammary glands and can strike both women and men (Encyclopedia Britannica). Breast cancer is the most common type of cancer in women in Finland covering 33% of all diagnosed cancers, and the most common cancer-related cause of death (15,1% of all cancers) (Suomen syöpärekisteri). However, with the current treatment and early detection the survival rate is also high; 97% of the breast cancer patients are alive after one year, and 89% after five years. (Suomen syöpärekisteri)

Breast cancer is mostly treated with one or a combined method of surgery, radiation therapy, chemotherapy, hormone therapy or targeted therapy. The breast might be completely or partially removed as well as the sentinel and other lymph nodes. (Syöpäjärjestöt)

In relation to the research this means that a growing number of women and their family and friends are living with post breast cancer related symptoms including lymphedema, which will affect their post-cancer quality of life especially if untreated or poorly educated.

3.3 The lymphatic system

The lymph system and the blood vascular system are the two major circulatory systems in the human body. (Choi, Lee & Hong 2012). The lymphatic system consists of

lymph, lymphocytes, lymph nodes, lymphatic vessels, the tonsils, spleen and thymus gland (Hendry, Farley & McLafferty 2012). The lymphatic vessels and nodes are presented in Figure 1.

Hippocrates (c. 460 – 377 B.C.), the father of western medicine, first defined the lymphatic vessel as “*white blood*” and introduced the term “*chyle*” to describe the milky tissue and lymph fluid (Grotte 1979, Chikly 1997). The lymphatic system was “forgotten” until 1627, when it was rediscovered by an Italian anatomist Gaspare Aselli, who named it “*venae albae et lacteae (milky veins)*” (Asellius 1627 cited in Choi, Lee & Hong 2012 p.5). Since then medical research and development has improved the knowledge of the system and its essential role to health and wellbeing (Choi, Lee & Hong 2012).

The lymphatic system has several vital functions to maintain a healthy immune system ranging from destroying microorganisms, unknown bacteria, virus and cancer cells as well as absorbing fat from the small intestine and removing cell waste matter and other foreign substances from the body (McLafferty, Hendry & Farley 2012). When the lymph system does not function properly patients might experience discomfort caused by visible swelling and accumulation of fluids.

The lymph system does not have a similar pumping mechanism than the blood vascular system. It needs help of the other mechanisms including peristalsis and skeletal muscle and respiratory pumps to help it to push through the lymph matter towards the lymph nodes (McLafferty, Hendry & Farley 2012).

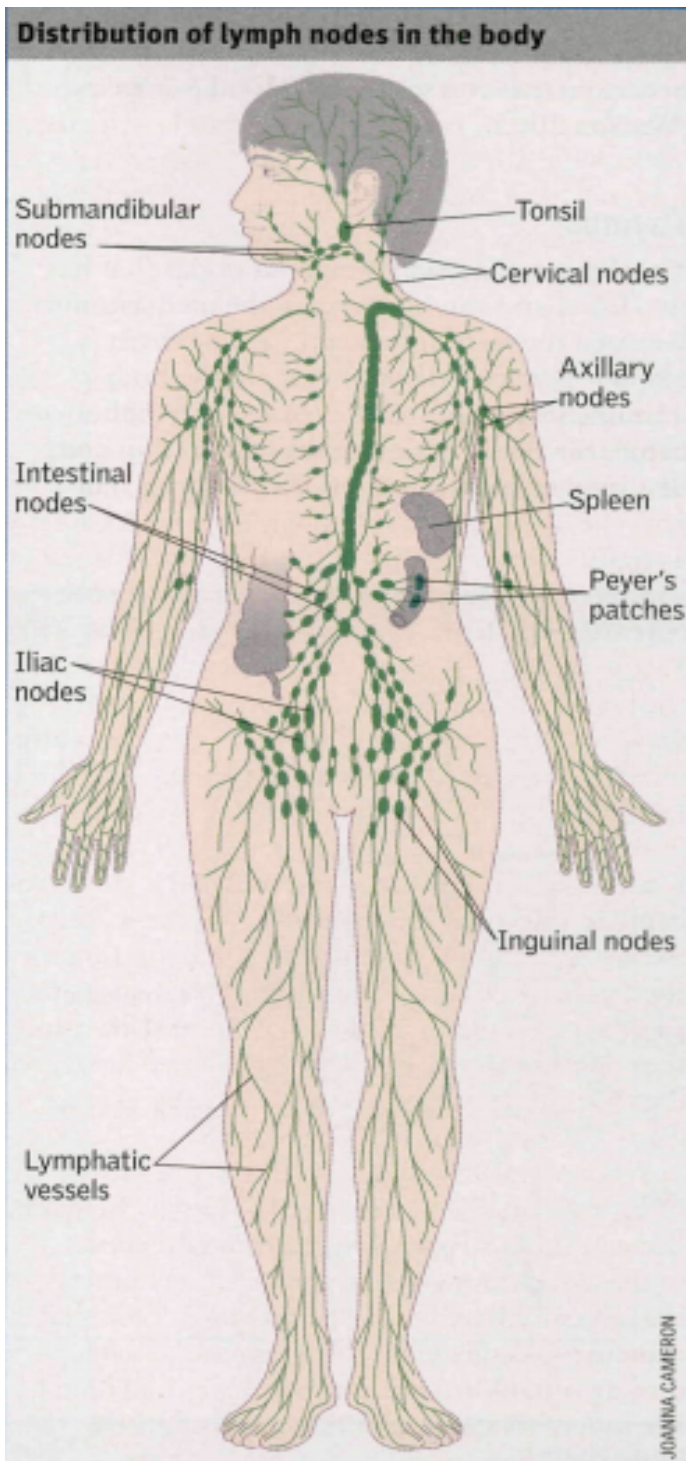


Figure 1 Distribution of lymph nodes and lymphatic vessels in the human body (Mc Lafferty, Hendry & Farley 2012)

3.4 Breast cancer related lymphedema (BRCL)

Breast cancer-related lymphedema (BCRL) refers to chronic swelling of the upper limb following an axillary surgery to lymph nodes (Bennet Britton & Purushotham 2009).

Lymphedema is an abnormal functioning of the lymph system and excessive buildup of fluid in the body (elephantiasis), often arms or legs (McLafferty, Hendry & Farley 2012), and there is currently no cure for breast cancer-related lymphedema (Sakorafas et al. 2006).

Figure 2 explains how breast cancer related lymphedema occurs in the arm. An example of visible swelling caused by lymphedema and pre- and post-operative differences in the arm can be seen in figure 3.

Lymphedema is a chronic and potentially disfiguring condition and can occur at any stage during or after cancer treatment (Ridner & Al. 2010). According to Ahmed et al. The prevalence of breast cancer related lymphedema varies from 0% to 56%; 1 up to 50% of survivors report symptoms consistent with lymphedema, with or without a clinical diagnosis (2008).

Lymphedema can be divided into two types: primary and secondary. Primary lymphedema is not common, and is caused by abnormalities in lymph vessels at birth. This study will focus on the secondary lymphedema caused by breast cancer. Secondary lymphedema happens when infection, cancer, surgery, scar tissue, trauma, deep vein thrombosis, radiation or other cancer treatments block or interrupt the lymph flow in the lymphatic system (Lymphedema).

Lymphedema should always be taken seriously and treated, as the swollen area is more prone for infections as the lymphatic system, that should remove the toxic cells and matter, is impaired (Käden turvotus). Prolonged and untreated lymphedema might cause irreversible and chronic swelling of the limb and malignant blood or lymph tumors (Anttila, Kärki & Rautakorpi 2007).

I would like to point out that it is usually normal to have some swelling after any surgical or other invasive operation and it is a sign of chronic lymphedema. Some medication might also cause temporary or long-term swelling in the body. Patients that belong to risk group of getting lymphedema or suspect having lymphedema should always consult a physician.

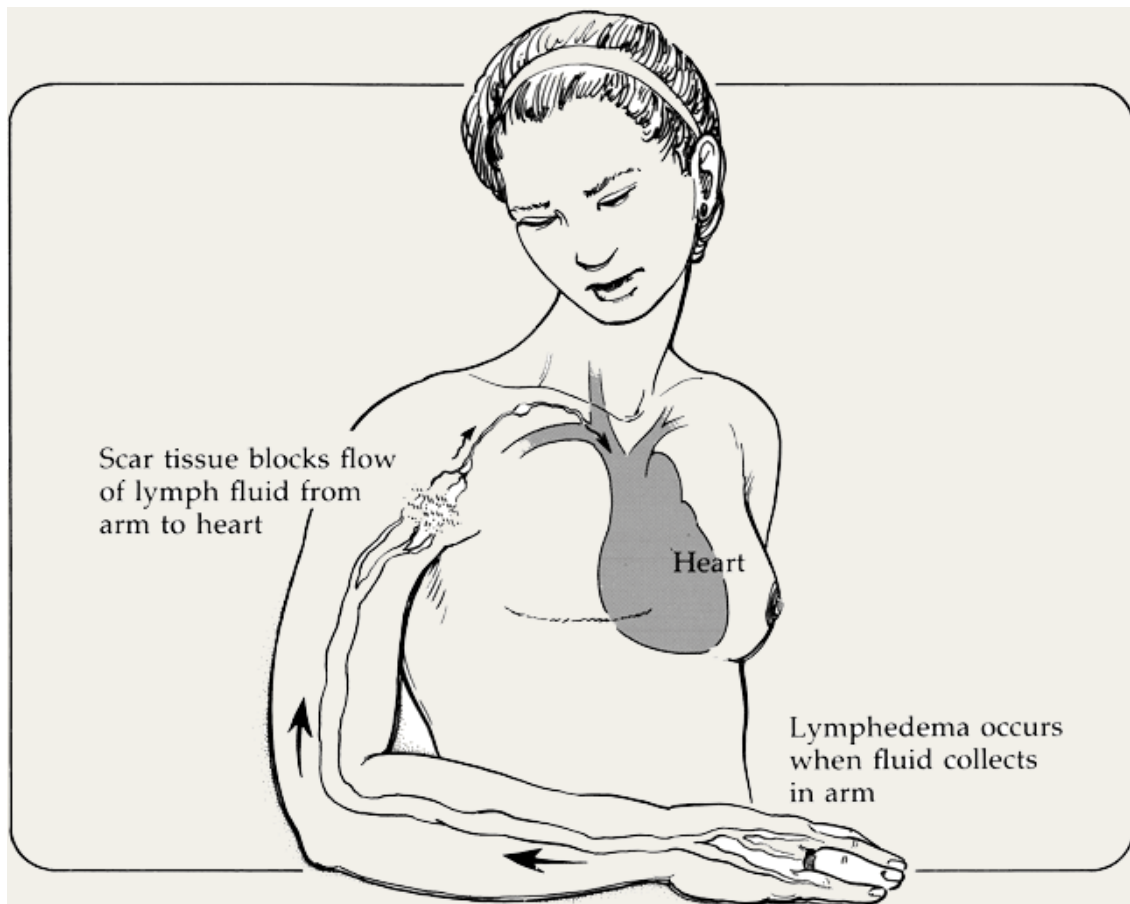


Figure 2 Lymphedema in the right upper limb caused by the removal of lymph nodes
<http://www.dslrf.org/breastcancer/content.asp?L2=5&L3=2&L4=3&SID=201>

3.4.1 Signs of breast cancer related lymphedema

Signs of lymphedema in breast cancer patients that both the nurse and patient can observe and detect include among others (Breast cancer):

1. Swelling in arms, shoulders, chest, fingers and legs; pitting (when pressing the swollen are with a finger, a “hole” will persist even after letting go). See figure 3 for picture of the lymphedema-related swelling.
2. Tightness of the skin
3. Decreased mobility in the hand, wrist or ankle
4. Ring, bracelet or clothing feeling tighter than before
5. Heavy sensation in the limbs



Figure 3 The picture on the left shows the visible lymphedema swelling. The arm in the post-picture has been treated with microsurgery. (<http://www.phlebolymphology.org/current-use-of-microsurgery-in-lymphoedema>).

3.4.2 Treatment of lymphedema

Since breast cancer-related lymphedema cannot be completely cured, treatments include different methods to ease and better the patients' life and especially focus on reducing the swelling of the affected arm (Sakorafas et al. 2006).

The standard treatment of lymphedema internationally is a two-phase complete decongestive therapy. During the first phase a professional treats the patients with aggressive physiotherapy, lymphatic drainage therapy, compression garments, bandaging and skin care (Sakorafas et al. 2006). The second phase includes a life-long self-care plan using similar therapy methods and self-monitoring (Ridner, Dietrich & Kidd 2011, Sakorafas et al. 2006). Even though swelling is caused by fluid accumulation, lymphedema cannot be treated with diuretics since the fluid will not be able to push through the lymph system when it has been damaged (Käsien turvotus).

There are currently some microsurgical procedures performed on lymphedema patients but long-term results are not well presented yet (Bennet Britton & Purushotham 2009).

3.4.3 Nursing management of lymphedema

General nursing management for lymphedema patients include patient education and advice, massage, skin hygiene to prevent infection and dry skin and making sure the possible garments are clean and dry. It is advisable to use cream-like products to substitute soap for washing to avoid skin to dry (McLafferty, Hendry & Farley 2012). It is necessary to note that to avoid infection risks you should never measure blood pressure or perform any invasive procedures like give injections or take blood from the affected limb unless there is an emergency (Royal College of Nursing, 2011).

Nurses have an important role as educators and they can guide the patient to look for a qualified lymphatic drainage therapist. Many of the patients suffering from lymphedema might be eligible for a doctor's referral for lymphatic therapy in Finland (Kela, lymfaterapia) meaning that they would get the lymphatic drainage therapy treatment at least partially paid for by the Finnish social security system. The research shows that patients with breast cancer related lymphedema report a poorer quality of life (Ridner 2005), why it would be especially important to educate breast cancer patients on the risk of lymphedema once they receive their cancer diagnosis and not wait until lymphedema occurs.

4 THEORETICAL FRAMEWORK

As the lymphatic system can be shown to be remarkably essential for the holistic health, it can be hypothesized to have an impact on the patients' quality of life. For this reason I have chosen 'Quality of life' (QoL), also 'Health-related Quality of life' (HRQoL) as the theoretical framework for this study. To further narrow the scope, I set out to find the three most influential main categories of quality of life that breast cancer related lymphedema impacts.

4.1 Quality of life

Quality of life refers intuitively to the level of contentment one experiences in his or her life. In many ways that is what the research also concludes but as it is a concept widely

used across science it is necessary to define each time what actually is meant by QOL and which dimensions (e.g. spiritual, financial, wellness) are included in each particular context. HRQoL and QoL models that are used commonly provide structure to the conceptualization of the QOL concept using common language that can be understood across studies (Bakas et al. 2012).

Bakas et al. refers to HRQoL as a dynamic and subjective concept, that can be multidimensional including physical, psychological, social and spiritual factors (2012). This abstract and often subjective concept has been defined in this study through different self-report surveys to gain a better understanding what it means for a patient to have a “*poor quality of life*” in specific areas of life.

It is important to keep in mind that each individual *experiences* life mostly subjectively and therefore anyone, including nurses, should not pretend to *know* how an individual patient is feeling or not feeling.

Quality of life (QOL) means a good life. A good life is the same as living a life with a high quality. This may seem evident, but it is necessary to make such a simple clarification, because medical jargon often uses very narrow concepts of the quality of life (for example, side effect profiles)....

...The subjective quality of life is how good a life each individual feels he or she has. Each individual personally evaluates how he or she views things and his or her feelings and notions. Whether an individual is content with life and happy are aspects that reflect the subjective quality of life (Ventegodt, Merrick & Andersen 2003 p.1030).

Past research shows that lymphedema correlates with both physical and psychological impairment (Beulac et al. 2002), which was one of the main motivators to review the lymphedema-related literature through the concept of quality of life.

4.2 Integrated theory of life (IQOL)

Integrated theory of life or IQOL is a meta-theory covering several QOL theories in a subjective-existential-objective spectrum. According to the IQOL a human being is an entity of consisting subjective and objective factors that start from the outer “*layers*” and continue towards the deepest nucleus that presents the existential quality of life and

between these layers lies one's happiness (Ventegodt, Merrick & Andersen 2003). According to Ventegodt et al. quality of life can be a subjective (everyone's own evaluation of their life), objective (how outer world views your life) or an existential (how good life is at a deeper level) concept that can be affected by other philosophies and ideologies (2003). All three aspects of QOL have a tendency to overlap as they are all loosely grouped with notions that are relevant to quality of life and the existential element is in the middle since it unites the subjective and objective (Ventegodt, Merrick & Andersen 2003). See figure 1 for the more detailed presentation of the layers included in IQOL.

This study focuses on subjective QOL, as all the surveys used in the articles were self-report scales based on the answers given by the patients. However it is important to understand that when an individual experiences something good or bad in life, it affects their QOL on a multidimensional level e.g. a lymphedema patient is experiencing chronic pain, which will affect their level of happiness and role in social life and ultimately could make them question their personal purpose on life.

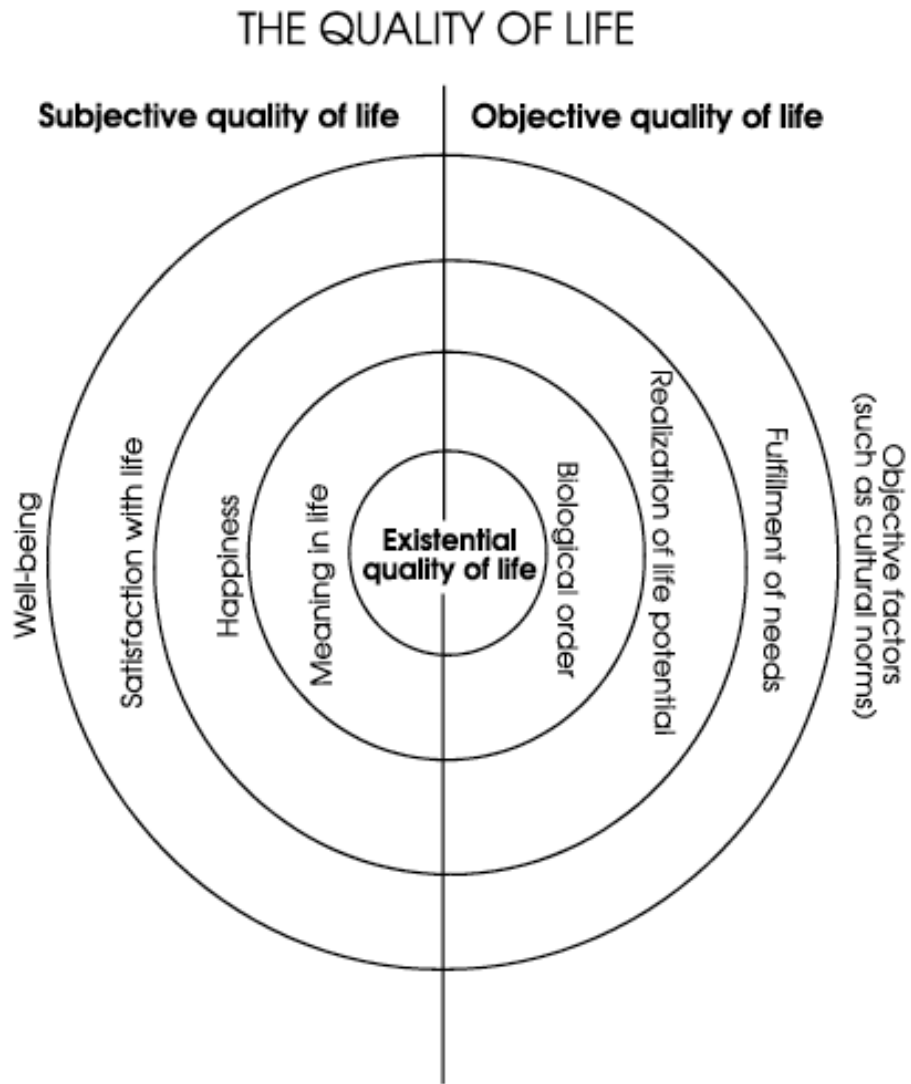


Figure 4 Integrated theory of quality of life sees a human being consisting of subjective (how you see it) and objective (how others see it) factors and a hidden nucleus of existential QOL (how good life is on a deeper level). Between these layers lies one's satisfaction and well being (Ventegodt, Merrick & Andersen 2003).

4.3 Aspects of integrated quality of life theory

4.3.1 Well being

Well being in this context refers to a subjective quality of life that can be determined superficially or in more depth and the complexity depends on how each individual determines the definition of well being (Ventegodt, Merrick & Andersen 2003).

When we meet other people, we always say, "How are you?" or "How's life?" We are thus asking that person to give us an evaluation of their quality of life. Such questions do not require a lengthy explanation of matters of life, merely a spontaneous assessment of life in general (Ventegodt, Merrick & Andersen 2003 p.1032).

4.3.2 Satisfaction with life

Satisfaction with life means that we live the life in a way that our expectations and desires are met and we can live the kind of life we want to. It is possible to be satisfied, or not be unhappy with life and simultaneously feel bad inside or think that there is no meaning to life (Ventegodt, Merrick & Andersen 2003).

People are usually less satisfied with life than their state of well being would indicate. People tend to feel good, but are not very satisfied, just satisfied. In retrospect, there is always something to be dissatisfied or disgruntled about (Ventegodt, Merrick & Andersen 2003 p.1033).

4.3.3 Happiness

"Happiness is an intoxication, a rare sweetness of life, when tiny bubbles sparkle" (Ventegodt, Merrick & Andersen 2003). Happiness is often related to dimensions like love and harmony with nature and is linked to individual's whole existence. It is rarely linked to concepts like money or (objective) state of health. According to IQOL happiness is in the depths of an individual that includes a special symmetry and balance (Ventegodt, Merrick & Andersen 2003).

Meaning of life

IQOL states that meaning of life is a very personal concept, which is often only shared with the closest friends and relatives. The search for meaning of life includes the notion that you also need to accept the meaningless of life and that there is "*an obligation towards oneself to make amends for what is meaningless*" (Ventegodt, Merrick & Andersen 2003 p. 1034). Meaning of life is the core of many religions and belief system and the issue with it is that it can also be lost, which leads to confusion and feeling of "*becoming lost in ourselves*" (Ventegodt, Merrick & Andersen 2003 p. 1034).

4.3.4 A Biological View of the Quality of Life: the Biological Information System and the State of Existential Balance

The biological view on QOL sees the human being as a living organism with cells that need accurate information in order to function and maintain a healthy and balanced bodily system correctly. In this view the physical health exposes the biological state of the body and the quality of life lies in between the life that is essentially lived and the formula for being the individual that lies within the depths of the organism (Ventegodt, Merrick & Andersen 2003). According to the biological view on QOL the conscious life we are living can not be balanced and optimal if the information system between the cells and organisms does not function properly hence the individual's health is affected (Ventegodt, Merrick & Andersen 2003).

The person who lives in such a way that their meaning in life is gradually lost is also the kind of person who is susceptible to illnesses that affect the physical appearance and well being of the body, seemingly without cause. The relation between the quality of life and illness is therefore best illustrated by using a theory of the individual as a biological information system (Ventegodt, Merrick & Andersen 2003 p.1035).

4.3.5 Realizing Life Potential

According to this view quality of life is closely linked to the human roots in nature as *life potential* is seen as the link between the human and the nature. This is a general theory of the interchange of significant information in living systems: from cell to organism to society. Human beings develop constantly starting with a fertilized egg that contains an enormous amount of information. The egg has to realize the potential of its information in order to grow and develop throughout life (Ventegodt, Merrick & Andersen 2003). According to IQOL human's potential is ultimately realized when you are "*living the life to the full*": having meaningful relationships, family and jobs (2003).

4.3.6 Fulfillment of Needs

According to this very concrete view the quality of life is high when your needs are fulfilled. The concept of need, however, is more ambiguous and complex than just *having* what you need. Ventegodt et Al. state that needing something is no longer something

that we need from the outside in order to be satisfied (food, shelter etc.), but something that an individual needs to *accomplish* for himself or herself (2003).

Are we then to fulfill this urge from the outside world or from within our inner depths? And does this then mean that our needs are fulfilled? Who or what in each of us, is it that needs? The ego? The self? Learned expectations? (Ventegodt, Merrick & Andersen 2003 p.1036).

According to Ventegodt et al the concept of need is easy to work with because we can find it in so many languages, but that the famous Maslow's hierarchy of needs has to be updated to present the modern world (2003).

4.3.7 Objective Factors

According to IQOL objective factors of QOL are easy to define and they include income, marital status, state of health and the number of daily contacts you have with other people. Despite the seemingly easy categorization it is necessary to define these factors since they are culturally related and often falsely confused with the kind of life that we think is "*right*" (Ventegodt, Merrick & Andersen 2003). According to IQOL objective quality of life can be a superficial notion that does not presuppose any deep reflection on the nature of the culture, even though it does reflect on how well we are adapted to the culture we are living in.

The research of QOL has tried to define the quality of life by measuring it objectively. These tests include e.g. counting of social contacts (sociological studies) and questions like "Can you walk?" (medical studies) that tries to create a list of factors that can be measured (yes/no, numerical scales) and are seen as part of a good life.

Quality of life in this study has been measured by using such tools in order to gain statistical information on how lymphedema has affected different dimension of quality of life.

4.4 How quality of life is measured

According to IQOL subjective quality of life means that individuals evaluate personally how he or she experiences things and feelings (Ventegodt, Merrick & Andersen 2003). In this study all the research data regarding patients' QOL has been obtained by subjective self-report surveys as patients were asked to answer questions regarding their own health and experiences.

The self-report surveys presented in the reviewed literature included questions covering at least physiological, psychological / emotional and social dimensions of how lymphedema impacts the patients life in their objective view. Some studies combined the surveys with physical measurements like weight, BMI and intracellular fluid in the affected upper limb (Ridner 2006, Beaulac et al. 2002, Ahmed et al. 2008). These measurement results are not included in this review.

Table 1 shows more detailed examples on three different quality of life measurement surveys and categories of quality of life that were used in the reviewed literature. Different statistical surveys were Medical Outcomes Study Short Form-36 (Ahmed et al. 2008), FACTB QOL (Ridner 2006) and EORCT QLQ-C30 (Bergenmar, Johansson & Sharp 2014) that all included 30-36 items answered by women of different stages of breast cancer. I was not able to obtain the full versions of each surveys, which is why the detailed questionnaires are not presented here.

Table 1 Quality of life measurement surveys used in some of the reviewed articles. See appendix 1 for full list of the reviewed literature.

Reference	(Ahmed et al. 2008)	(Ridner 2005)	(Bergenmar, Johansson & Sharp 2014)
Frame-work	Health-related quality of life (HRQOL)	Quality of life (QOL)	Health-related quality of life (HRQOL)
Quality of life categories	<ul style="list-style-type: none"> • Physical functioning • Physical role limitations • Bodily pain • General health • Vitality • Social functioning • Emotional role limitations • Mental health 	<ul style="list-style-type: none"> • Physical well-being • Social/family well-being • Emotional well-being • Functional well-being • Additional breast cancer concerns 	<ul style="list-style-type: none"> • Functional scales (physical, emotional, social and cognitive) • Symptom scales (fatigue, pain, nausea/vomiting) • Single items (financial impact and symptoms) • Global quality of life
Statistical Method	Validated <i>Medical Outcomes Study Short Form-36</i> ; Self report survey of 36 questions covering 8 concepts	<i>FACTB QOL</i> -Self report of 36 items and physical testing for skin integrity, lymphoedema stage, height, weight and extracellular fluid	<i>EORTC QLQ-C30</i> Self-report survey of 30 items
N	1183 breast cancer survivor women with and without diagnosed lymphoedema Age 55-69	128 breast cancer survivor women of which 50% with lymphoedema Age 21-80	88 women with breast cancer and planned radiotherapy Age 33-85

5 AIM AND RESEARCH QUESTIONS

The aim of this study is to review existing literature on how taking the lymphatic system into consideration in nursing affects patients' quality of life. Due to the extensivity of this topic, the study focuses only on female breast cancer related lymphedema patients

In order to find out what kind of possible concrete impact taking the lymphatic system into consideration in nursing might have the research questions are:

1. What are some of the effects on quality of life that breast cancer-related lymphedema patients' experience?
2. How should nurses take the lymphatic system into consideration in practice?

5.1 Limitations

The lymphatic system and all its conditions and physiological effects is such a comprehensive topic that I have chosen to narrow the scope of this study by focusing only on breast cancer related lymphedema studies. The results can therefore not be generalized to any other condition or cancer. The required length of this thesis and allocated study time also limits the amount of research material that can be used to analyze the literature.

Equally the theoretical framework of quality of life is such a multidimensional concept, that the background material is by no means an exhaustive list of all the literature. There are so many studies about quality of life in different fields of science and especially in health and medicine related studies, that it was justified to choose just a few different studies to represent a holistic view on QOL in this context. The surveys used to define QOL in the literature were only partially presented in the articles. I would have wanted to include all the different surveys in the appendices to back up the research presentation. However, I was unable to obtain full versions of the questions used in the surveys as the reviewed literature only offered conclusions, statistics of the answers and some highlights of the answers given by the patients.

Although tempted to include, I have excluded many studies covering the lymphatic system and how taking care of it can affect your overall health or other conditions than breast cancer-related lymphedema. I have also excluded all practical information on how the nurses or patients could perform simple lymphatic drainage.

Finally it is needs to be mentioned that I have not researched any other nursing school's curriculums than that of Arcada, and therefore the criticism towards nursing studies can not be generalized or applied to nursing studies in any other school locally or globally.

6 DATA COLLECTION

The articles chosen for both background information and the literature review were in relevance to the main aim of the study. Most of the research data used in this study was collected by using the university web portals of Nelli at Arcada University and at the Medical Library of the Helsinki University (Terkko). I was also given some articles from the place of commission for this study, which had been earlier obtained from the University of Helsinki.

The 10 articles (appendix 1) chosen for the literature review were picked with the focus on lymphedema, nursing practice and quality of life and were all published after year 2000. The background articles had more medical focus on lymph-related research and were also published after year 2000.

The most common keywords used in different combinations (AND / OR / +) were "lymphedema", "quality of life", "breast cancer", "lymphatic drainage", "health promotion", and "patient education". Keywords were mostly narrowed from "cancer" to "breast cancer", further to "breast cancer in women" to specify a more exact search area. The general statistics and cancer foundation information was obtained online using Finnish search words.

The chosen peer-reviewed research articles, medical information (definitions), and general knowledge (cancer foundations and statistics) used in the study were either in English or Finnish language. I translated Finnish statistics, health guidelines and some research information used in the study. Finland related statistics and cancer care information were used to bring some details that attach this study to the Finnish nursing environment.

Articles that were older than 14 years were excluded, as well as those that were very specifically tied to a certain caring institution e.g. local caring home or were not strictly breast cancer related. I also excluded studies that were breast cancer related but did not deal with lymphedema issues.

6.1 Articles

I found the literature matrix (short version in table 2 and full version in appendix 1) to be a key element for analyzing the results, as it made it easier to choose the relevant articles for the main review. Using main topics and categories helped to make sure that all the material was in line with the study questions and would actually provide answers to them. At that point I found out that some of the articles I thought I could use were actually out of the study scope and had to be excluded. Table 2 presents a short version of the literature matrix used to analyze the reviewed articles. The short version summarizes the key results and conclusion of each article for a fast examination. The full version found in appendix 1 provides more comprehensive list of hypotheses, methods, results and conclusions.

Table 2 Short literature matrix presenting the key findings and conclusions of the reviewed articles. See appendix 1 for full list of hypotheses, methods, results and conclusions.

	Author/ Date	Key results	Conclusions
1.	(Ahmed et al. 2008)	Both women with and without diagnosed lymphedema had substantially lowered HRQOL compared to breast cancer survivors without lymphedema or arm symptoms.	Clinical trials are needed to determine what interventions can improve lymphedema and impact HRQOL for breast cancer survivors.
2.	(Beaulac et al. 2002)	Women with lymphedema scored significantly lower on 4 of the 5 subsections than women without lymphedema, even after adjusting for other factor influencing quality of life.	Lymphoedema occurs and its impact should not be underestimated.
3.	(Bergenmar, Johansson & Sharp 2014)	Patients that were contented with information reported higher global health status and emotional functioning. There were positive associations between “satisfaction with information” and HRQoL.	There is a general need for patient-centered information.
4.	(Nielsen, Gordon & Selby 2008)	Present-day patient recommendations have the capacity to profoundly alter quality of life.	Optimal methods of precautionary education delivery need to be identified.
5.	(Petrek, Pressman & Smith 2000)	Lymphedema can be a debilitating and visible condition for many women. It is also a daily reminder of the health care system’s failure to educate them appropriately and to respond effectively to their condition.	Patient education, clinical response to symptoms of lymphedema and health care policy need improvement.

6.	(Ridner 2006)	Offering quality pretreatment lymphedema education may diminish breast cancer survivor's discontent with information received about lymphedema.	Healthcare personnel must be competent about breast cancer treatment-related lymphedema and offer consistent patient education.
7.	(Ridner 2005)	Breast cancer survivors with lymphedema reported poorer QOL compared with those without lymphedema.	Current lymphedema treatments seem not to provide holistic relief of symptoms to lymphedema patients therefore additional interventions are needed.
8.	(Ridner 2009)	People who understand their self-care treatment is helping may show better emotional and physical health.	Lymphedema patients have underlying psychosocial problems and require routine assessment for them.
9.	(Ridner, Dietrich & Kidd 2011)	Patients that had more lymphedema symptoms spent more of their time on self-care and reported a poorer QOL.	Lymphedema management needs to be approached from a multidisciplinary perspective in order to improve patients' QOL.
10	(Taghian et al. 2014)	Lymphedema touches physical, psychological and emotional aspects of a woman's life.	Breast cancer patients need early patient education and lymphedema screenings.

6.2 Data analysis

The literature reviewed in this study has been analyzed by inductive content analysis. According to Graneheim & Al. content analysis has initially been a tool to manifest content of communication, but has later expanded to include latent (hidden) connotations as well (2003). Content analysis is a method to analyze and categorize research information and creating categories is the main feature of qualitative content analysis (Graneheim & al. 2003). Category refers to a group of information that shares a commonality and answers the question “what?” (Graneheim & al. 2003). Eventually the results in this study were divided in four categories.

Content analysis could be performed either inductively or deductively. The content analysis in this study has been inductive in nature. Inductive content analysis was a relevant method for analysis in this study as it is used when there is no prior research dealing with the phenomenon or it is fragmented (Elo, Kyngäs 2008). According to Elo & Kyngäs inductive content analysis process includes three phases that are preparation, organization and reporting of the results (2008). Preparation phase consists of relevant data collection, organization phase includes creating categories and abstraction and the reporting phase includes describing the results by the content of the categories (Elo, Kyngäs 2008). The more detailed data analysis process of this study is explained below.

6.2.1 Preparation phase

The first phase of data collection was gathering articles for further analysis. It was rather straightforward to look for background material to find medical facts for lymphatic system, breast cancer, lymphedema, basic nursing management and Finnish cancer statistics. The search to find for relevant articles for the literature review was, however, more complex. Initially I looked for any articles that handled breast cancer and lymphedema to see what kind of material was available. It became clear quite soon that the notion of QOL was introduced in many articles so I started narrowing down to look for literature focusing on quality of life related lymphedema studies.

6.2.2 Organization phase

This is when the organization phase started. Once I had around 30 relevant articles I started to sort them to see what information was available and how well they were nursing related. At this point I began to formulate the research questions. This was a key element in being able to narrow the scope of the literature material. I started with one research question and began to look for the answers from all the articles I had.

The second research question came quite naturally from the literature that first matched the original question. At this point I started to be around 15 articles that I thought I could use for the main review and I started to fill Arcada's literature matrix template (appendix 1).

This was the most useful method and tool I used during my writing. As I looked for the information for each box I found answers and results I had missed during the first rounds of reading and I also had to exclude some articles that did not answer my research questions even though they matched the initial search criteria. Finally I was down to ten articles that were used for the literature review results.

6.2.3 Reporting phase

As Elo & Kyngäs state, the reporting phase means that you describe the results by the *content of the categories* (2008). I had already gone from general breast cancer lymphedema to quality of life issues and now I had to look for even more detailed categories. Eventually I formulated four categories from the QOL related surveys to give a more detailed and concrete view on the topic. The reason for choosing the categories (patient education and social, physiological & psychological impact on QOL) was purely based on the recurrence in the reviewed literature. At this point I left out categories that were not found in all the surveys that were used to measure the level of QOL.

It required a lot of reading and re-reading of the same material to get to this point, so the presenting of the results was probably the least laborious part of the process once all the categories were figured out. Overall the process happened from top to down, or from the big picture to the small one. I started with a pile of articles that *felt* relevant, but once I

started matching them with research questions and categorization happened, the reality was that only a handful could be accepted.

7 ETHICS

According to Gajjar ethical conduct is an important part of any research project (2013). Ethical norms are guidelines that both protect the intellectual property of the original authors but also encourage for collaboration when used correctly. Another aspect of ethical honesty and openness is to be able to hold researchers accountable for the public. Finally the codes and policies for research ethics aim to maintain the quality and integrity of research goals, results and further use in science (Gajjar 2013).

The ethical consideration of this study was plagiarism. To avoid ethical errors I have followed Arcada's guidelines for scientific research and submitted the final work to Arcada through the automated plagiarism detection system of Urkund.

My personal opinions, which are always most prone to bias, are presented in the introduction and discussion sections.

8 RESULTS

8.1 How BRCL impacts patients' quality of life

The first research question of this study is what are some of the effects on quality of life that breast cancer-related lymphedema patients' experience? After reviewing the literature it can be stated that women with breast cancer-related lymphedema report poorer quality of life than breast cancer survivors without lymphedema. As there were a few different categories of QOL presented in the literature (table 2), I chose to present three that I felt would be most useful for a nursing thesis. The QOL categories chosen are social (activities and relationships), psychological and physiological.

8.2 How BRCL impacts patients' social life and relationships

Lymphedema is usually a visible condition that requires systematic self-care. The affected limb is larger than the other one and often needs special compression garments, sleeves and hygienic measures. All of these changes can have an impact on the patients' social behavior even to the point that they start isolating themselves (Ridner 2009). Some patients did not want other people to see the special sleeves and garments (Ridner, Dietrich & Kidd 2011), and some reported being very frightened of getting an infection or doing too much exercise because that could result in more swelling and pain (Beaulac et al. 2002).

Patients also experienced that quality of sleep and relationships with partners were affected due to lymphedema and side effects of the condition and self-care and (Beaulac et al. 2002). Beaulac et al. found out that patients reported atypical sleeping disturbances where they needed to use pillows to elevate the arm or try to sleep only on the non-swollen side of the body (2002). It was also reported that some partners left the bedroom because they either could not tolerate the patients' tossing or turning or the bed became too small due to the pillows (Beaulac et al. 2002).

It was stated that lymphedema patients experience social anxiety and avoidance (Ridner 2009). Some patients had abandoned their usual activities and hobbies with family and friends they had for years due to the inconveniences attached to the condition and self-care (Beaulac et al. 2002, Ridner 2009). It was also reported that lymphedema self-care is time consuming and inconvenient because the arm had to be taken care of and wrapped even they were late from somewhere or tired (Ridner, Dietrich & Kidd 2011).

8.3 The psychological impact of BRCL

Due to the chronic and sometimes disfiguring nature of lymphedema, the impact on patients' psychological well-being can be significant (Sakorafas et al. 2006). The research

showed that breast cancer patients with lymphedema accessed mental health services more often than those without it (Ridner 2009).

After reviewing the literature it seems that patients often feel that not only is lymphedema an unfortunate condition on its own but also a constant reminder of breast cancer even when the patient had been declared cancer-free (Ridner, Dietrich & Kidd 2011, Ridner 2009).

Patients also feared that since both breast cancer and lymphedema happened, “*something else*” would also go wrong (Ridner 2009). They reported having lost confidence in the body, feeling anger and sadness and expressing depressive symptoms (Ridner 2009). Some patients also experienced that they were concerned about sexual activities, and some of the patients’ partners felt either uncomfortable with the appearance of the limb or feared for hurting the patient (Ridner 2009).

8.4 The physiological impact of BRCL on patients’ wellbeing

Lymphedema is associated with enlargement of the arm, which results in discomfort and upper-extremity disability (Petrek, Pressman & Smith 2000). The affected limb is also more prone to cellulitis and lymphangitis (inflammation of the lymphatic vessels) (Petrek, Pressman & Smith 2000). In the study conducted by Ridner et Al. six arm symptoms related to lymphedema were noted in total: heaviness, tightness, coldness, achiness, hardness and swelling. Other predominant physiological symptoms were pain, sleeping troubles and fatigue (Ridner, Dietrich & Kidd 2011). It was also reported that lymphedema was seen as a “*cosmetic deformity*” that cannot be disguised with normal clothing (Petrek, Pressman & Smith 2000).

Patients also reported feeling that the arm does not work “*like it used to*” and it creates lack of self-confidence to perform social or recreational activities and perform self-care (Ridner 2009). Some patients also perceived the limb to be bigger than it was and felt the need to change clothing to “*fit*” the affected arm (Ridner 2009). It was also reported that patients performing self-care felt that they did not *see* enough results

which affected the motivation to continue the care program (Ridner 2009).

8.5 Considering the lymphatic system in nursing practice through patient education

The second research question was how should nurses take the lymphatic system into consideration in practice? After reviewing the relevant literature through the selected theoretical framework (three main categories of quality of life) one major component affecting all of the aforementioned quality of life categories was found. This component is patient education. The research stated that the key to improving the patients' quality of life requires more systematic approach to pre- and postoperative patient education from the health care personnel (Anttila, Kärki & Rautakorpi 2007, Bergenmar, Johansson & Sharp 2014, Ridner, Dietrich & Kidd 2011, Sakorafas et al. 2006).

Ridner & Al. discovered in their research that majority of the patients felt that they did receive information from the physicians on lymphedema self-care but it was not sufficient (2011). The same study suggested that since the patients are often more in touch with other health care personnel that only the physicians, that it should be those professionals that could also provide the information (Ridner, Dietrich & Kidd 2011).

Patients were reported to experience distress caused unintentionally by clinicians who focused primarily in cancer care and recurrence and trivialize lymphedema because of its nonlethal nature (Petrek, Pressman & Smith 2000). Ridner et al. suggested that nurses do to provide adequate education because they either do not possess sufficient amount of information or they do not see it as their responsibility in their working environment (2011).

The medical advances in breast cancer treatment have improved the survival rate, which means that more and more women will need education on post-treatment care including complications like lymphedema (Beaulac et al. 2002). McLafferty et al. stated that nurses that have a good understanding of the lymphatic system, can both identify changes in it and select appropriate interventions (2012). According to studies the health

care personnel's role seems crucial especially since due to several elements in lymphedema care routines, the patients feel a substantial burden and latent barriers associated to self-care; some studies show that only 45% of 74 breast cancer survivors with lymphedema complete their self-care routines prescribed by their therapist (Ridner, Dietrich & Kidd 2011). Patients that complete the self-care have better long-term outcomes and therefore it is suggested that not only will the long-term management of lymphedema result in better patient health, but also will reduce the health care costs (Bergenmar, Johansson & Sharp 2014, Ridner, Dietrich & Kidd 2011).

Overall benefits for adequately informed lymphedema patients include higher level of satisfaction with care, lower levels of anxiety, improvement in sense of control and better quality of life (Bergenmar, Johansson & Sharp 2014). Sufficient patient information increased the patients' chances to take part in decision making regarding their treatments, follow-ups and coping with side effects (Bergenmar, Johansson & Sharp 2014).

9 DISCUSSION

The aim of this study was to find out what possible impact on quality of life would taking the lymphatic system into consideration in nursing have. Furthermore I set out to find how nurses could take the lymphatic system into consideration in practice.

We are taught throughout our studies to care for our patients holistically having all essential needs of the patient in mind. I can remember many of our earliest courses covering spiritual, emotional and physiological needs of patients' in different stages of their illness, recovery or dying. I am studying with an international study group so I have also been attending several classes on how nurses need to take cultural, religious and ideological needs of the patient into consideration.

All of the above does sound essential and will probably benefit all of us students at some point in our nursing career whether working in our home countries or abroad. However I have felt that simultaneously some of the basic physiological and medical aspects have been neglected in favor for cultural and social studies. The experience I

have from the practical trainings and work life prior to my nursing studies is that nurses are expected to be very knowledgeable anatomically, know how the human physiology works and understand medical conditions and even pathology. It is hard to understand different reactions and illnesses without understanding the basics. This is the reason why I chose to look for material to give an example why the lymphatic system should not be forgotten in nursing studies. I have not been able to cover most of the information how the lymphatic system affects our health and healing, but I am hoping what I have found is enough to plant the seed for anyone who is interested in developing the nursing studies field.

It became clear through reviewing the relevant literature that breast cancer-related lymphedema patients experience a wide range of challenging alterations in social, psychological and physiological fields of life. It was discovered that adequate and sufficient patient education is the practical method for nurses to impact patient quality of life and is the key for prevention and consistent patient self-care. Quality of life is an extensive concept that can be analyzed from several points of view depending on the viewer. The literature and IQOL (different theories of QOL) offer a solid base for understanding that when we talk about someone's quality of life being affected, it usually means that their life, feelings and sense of importance might be very deeply disturbed and touched. Their life might be changed to the level that they feel that they are not worthy of living or can not cope with the new situation in the old environment. It requires experience and professional skills to be able to have adequate understanding of the topic and offer appropriate empathy and support for somebody whose quality of life has been affected and altered.

Many might consider the lymphatic system, its anatomy and conditions related to it be only part of the physicians' playground and therefore argue the whole topic to be too '*medical*' for nurses. However, it can be argued that nurses have a significant, sometimes the most important, role on patient education as the reviewed literature also shows. It became clear that nurses are often the most frequent or the most approachable contact during treatments and recovery and have therefore an essential role in both education the patient and affecting the patients' attitude in following different self-care routines. I have often heard patients and customers crediting one single nurse or therapist

for “*saying the right words of encouragement*” or offering the advice that “*saved their life*”. Taking the current research into consideration, it can be argued that nurses should be equally educated on the lymphatic system as on any other important physiological component of the human body to gain the knowledge to be more proactive educators in early stages of cancer diagnosis, which is the key for prevention and appropriate care. The research showed that patients felt that they first went through cancer and *then* lymphedema, which acted as a reminder for cancer. It might be useful to realize how connected they actually are, and the earlier the patient gets used to the self-care plan or is aware of the lymphedema risk, the more time they have to be adjusted and to accept the condition. That in turn will lead to higher self-care statistics, which would affect quality of life favorably.

The literature suggested that nurses might not understand the role of the lymphatic system in breast cancer or feel that it is not *their responsibility* to act upon lymph-related issues. That answers only partially the question why lymphatic system is often ignored in nursing but I was unable to find answers to why it has not been included in nursing anatomical and physiological studies. Taking the vascular system as an example: its anatomy and function is taught at the nursing school. In addition to that the nurses are taught to measure the blood pressure, analyze the findings on a necessary level and detect basic conditions related to high or low blood pressure and offer patient education on diet, exercise and other elements that affect the condition. This is a very comprehensive and justifiable amount of information although nurses are not vascular specialists or surgeons. With all the information we have on lymphedema and its effects it seems unclear why the lymphatic system, *the white blood*, is ignored in the nursing curriculum.

10 CRITICAL ANALYSIS

One of the most challenging aspects of this study was to find a right scope of focus for a topic that first of all is immensely extensive and secondly seemed initially more medical than nursing related. I was, however, determined to find an angle to deliver the review so I worked to look for a more narrow scope to finally find a focus that would be appropriate for a nursing thesis. For this reason I chose breast cancer related lymphedema pa-

tients as it was possible to achieve sufficient amount of previous studies regarding the topic combined with nursing perspective.

I was unable to find any relevant information on the benefits of the lymphatic system and its physiology in the nursing study books represented in the school library of Arcada. Many books included short introduction to the physiology of the lymphatic system but it was not tied to nursing practice or health benefits in any of the books that were available for studying. It was therefore necessary to turn into medical research material for the basic background information. Nevertheless I think that also speaks for my study results; nursing students might not receive enough education on lymph related issues.

As always with matters of passion, this study too is prone to bias. It is possible to handle a topic near to your own interests in favor for the wanted results and forget the critical view. I struggled with this during the process: I was unable to find any relevant studies opposing the results that are presented here. Either they do not exist or I could not find them.

Another risk for bias is facts that a private company commissions the work. The company and their owner / staff could affect the view on the topic especially in this case where the commissioning part is specializing in lymphatic treatments among other similar therapies. I have been trained at Pisara for lymphatic drainage therapy and there is a possibility that the information given could be out of date, false or biased. To avoid this I have used medical and nursing research material to reference all the information whether it was knowledge I already had or not.

Finally it should always be noted that studies like these are short and therefore the scope of the research material is very narrow, which might falsify the conclusion and present very limited results. It should also be mentioned that when working alone on a scientific study you run a bigger risk of handling the material with a constricted and subjective style in comparison to studies analyzed by several people. Subjective and narrow study results can lead to hazardous generalizations and illusion of being an expert on the topic.

In conclusion it is necessary to recommend more studies on the topics handled in this study in order to be able to make more competent assumptions.

11 FUTURE STUDIES

Further studies should be conducted whether including the lymphatic system in nursing studies would benefit nurses' ability to deliver more systematic patient education to breast cancer patients.

12 CONCLUSION

Impaired lymph system and lymphedema weakens the patients' quality of life (Ridner 2006) and with the current knowledge the health care personnel could alter the quality of life (Nielsen, Gordon & Selby 2008). However the results show that even though the condition of lymphedema is widely known among the health care professionals, there is no systematic approach to pre- and post- patient education among breast cancer patients (Anttila & Al. 2007).

The reviewed literature supports the idea that the lymphatic system should be taken into consideration in the patient education to better the quality of life of the breast cancer patients. Nurses are unable to educate patients without having the adequate level of knowledge why it should be considered to add lymph-related studies to nursing curriculum.

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