

Nina Paaso

# Gym Training Guide

-An Introduction to the Fundamentals of Weight Training

Sports and Leisure  
Management

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KAJAANIN  
AMMATTIKORKEAKOULU  
UNIVERSITY OF APPLIED SCIENCES

## ABSTRACT

**Author(s):** Paaso Nina

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Strength training has become more popular in the past few years and therefore it is crucial that the exercises are done properly from the start in order to prevent any injuries.

The thesis was carried out as a functional thesis, a product development process. The purpose of the thesis was to plan and implement a product: gym training guide for beginners. The product contains instructions of how to use the cardio machines, pictures of starting and ending points of exercises (machines and free weights), instructions of the techniques in English and Finnish, and also anatomical pictures of the target muscle group. Target group of the guide is the working aged (15-64).

The objective of the author was to improve and utilize personal training and coaching skills. Additionally, learn to plan and implement a product related to health and fitness and also to cooperate with a big company. Aim of the commissioning party EasyFit Oulu Ritaharju was to improve their customer relationship by providing the gym training guide and keep their new customers as they learn how to use the gym equipment and gain confidence to train at the gym. Research questions are: What are the benefits of resistance training? What are the different types of strength training? What is the right form when performing the movement? How to use the cardio machines?

The product will be on the commissioning party's website as a pdf file and a printed version that can be given to the customers, and also in the usage of the personal trainers of the commissioning party. The author and the commissioning party EasyFit Oulu Ritaharju have the copyright to the product and material.

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## 1 INTRODUCTION

Nowadays people are more interested about health and fitness, and gym training has become a really important part of it. Therefore, it is crucial that the beginners learn the movements properly from the beginning in order to prevent any injuries.

The thesis was carried out as a functional thesis, a product development process. The purpose of the thesis was to plan and implement a product: gym training guide for beginners. The product contains instructions of how to use the cardio machines, pictures of starting and ending points of exercises (machines and free weights), instructions of the techniques in English and Finnish, and also anatomical pictures of the target muscle group. Target group of the guide is the working aged (15-64).

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According to the objectives of KUAS Degree of Sports and Leisure Management there are several competences for students. The competences are physical activity, health promoting physical activity and coaching, pedagogy and didactics and areas of physical exercise involving leadership and enterprise.

The research questions are: What are the benefits of resistance training? What are the different types of strength training? What is the right form when performing the movement? How to use the cardio machines?

The material will be shared as a pdf guide in the website and also as a printed version. The guide will also be in the usage of the EasyFit personal trainers.

## 2 UKK RECOMMENDATIONS FOR PHYSICAL EXERCISE

The UKK Institute's "Physical activity pie" (figure 1.) is a health-enhancing physical activity guideline for adults (18-64). According to the activity pie, an adult should have at least 10 minutes of physical activity that is moderate intensity, aerobic activity, accumulating total at least 2 hours and 30 minutes per week, in order to promote health. Or as an alternative, vigorous-intensity aerobic activity at least 1 hour and 15 minutes per week. Along with, muscle-strengthening and balance training should be done at least twice a week. Physical activity that improves muscular strength and balance should be done at least twice a week in addition to aerobic training. The recommendation is to do 8 to 10 movements for large muscle groups and the movements should be repeated 8 to 12 times. However, the demand of physical training depends on a person's own basic level of fitness and his or her objective. (UKK Institute, 2016.)

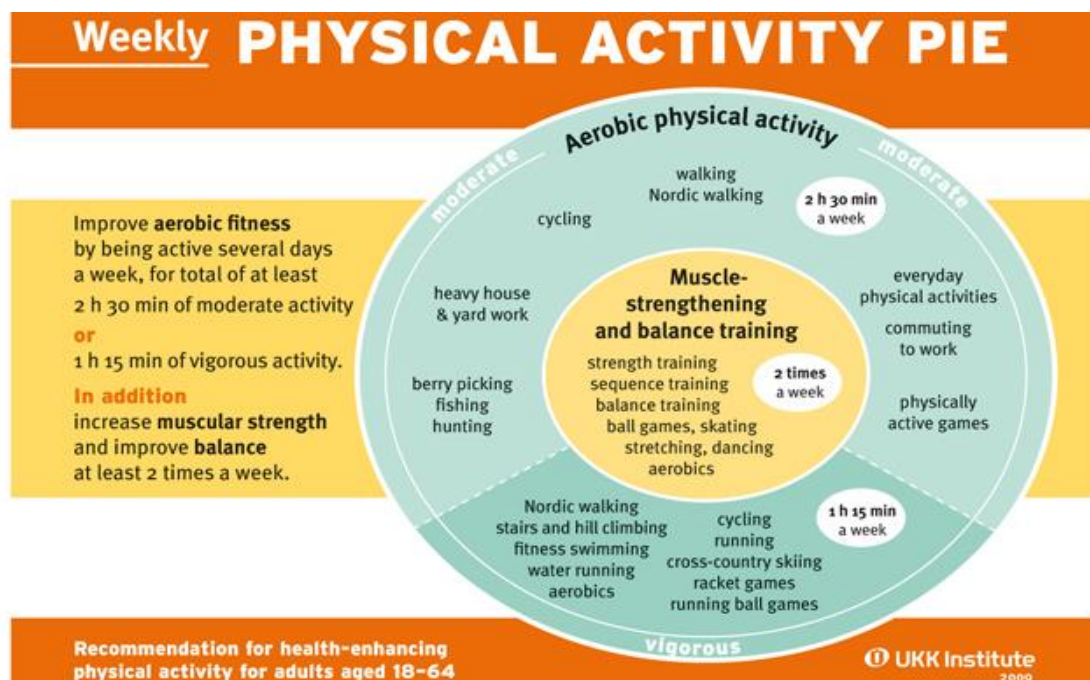


Figure 1. Recommendations for physical activity for adults. (UKK Institute, 2009).

### 3 BASIC MUSCLE ANATOMY AND PHYSIOLOGY

About 40-50% of human body is muscle tissue. Humans have approximately 650 muscles, of which voluntary 430. Muscle tissues have many functions; they move the body, perform movements and maintain posture. Muscle tissue also protects the internal organs, nerves and blood vessels, regulates orifices, peristalsis, regulates blood stream and regulates, maintains and generates body temperature. Muscle tissues are either voluntary or involuntary, and there are three types of muscles: cardiac, smooth and skeletal muscle. (Kauranen & Nurkka 2010, 111-113.)

**Cardiac muscle** is only found in the heart. It is involuntary muscle because we have no control of the rate at which it contracts. **Smooth muscle** is found in the inner organ's walls, such as blood vessels and respiratory tracts. Smooth muscle is never connected to the bones, therefore it is involuntary muscle. **Skeletal muscle** is voluntary and attached to at least two different bones. As they contract, the muscles bring bones together and create a movement. The muscle attachment starts from the origin and ends to insertion. The muscle tissue is not attached straight to the bone, there are tendons in the both ends of muscles. (Kauranen & Nurkka 2010, 111-113.)

There are different various shapes and forms of muscle fiber in skeletal muscles. Thus, the arrangement of the fibers in the muscle may affect its function. These forms of muscle fibers are: long muscle fibers: longitudinal, strap or fusiform muscles and shorter muscle fibers: pennate muscles, which may be unipennate, bi-

pennate or multipennate (figure 2.). Pennate muscles have greater force production than in longitudinal muscles but longitudinal muscles are able to shorten over a greater distance. (M. McGinnis 2005, 255-256.)

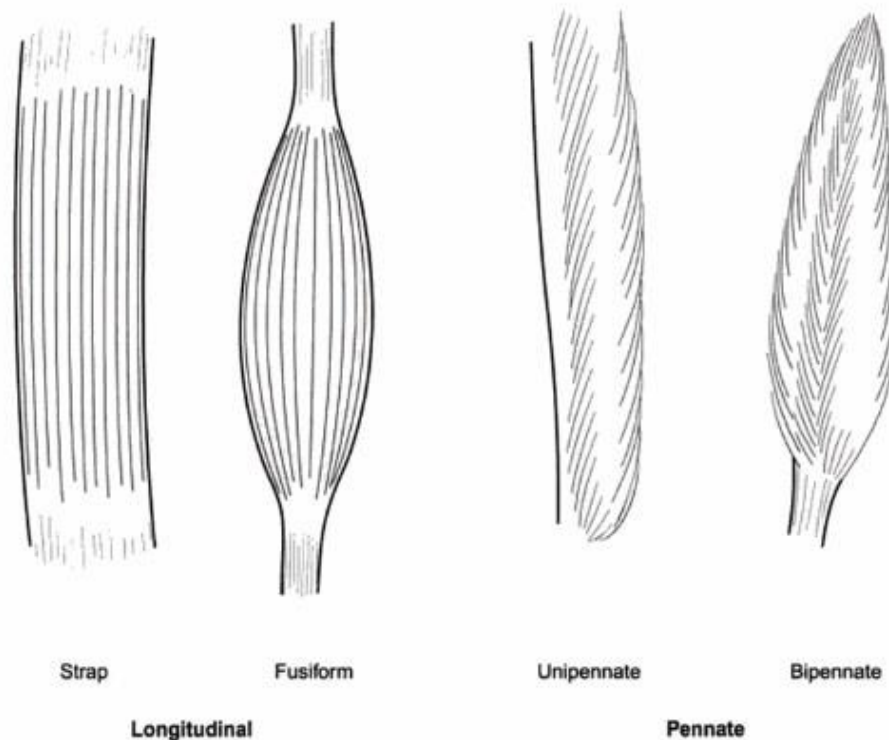


Figure 2. Examples of fiber arrangements in skeletal muscles. (M. McGinnis 2005, 256).

### 3.1 Muscle cells

Muscle tissue can be separated into two main groups: **slow muscle cells** (type 1) and **fast muscle cells** (type 2). Slow (red) muscle cells contract slowly and the force production is low. However, the endurance level is better in the slow muscle cells. Therefore, human is able to perform the low impact and long duration muscle work. Slow muscle cells energy metabolism is aerobic as they use oxygen as energy. Slow muscle cells can be found muscles that helps maintaining the posture, for example. These kind of muscles are usually deep muscles and function as a rotators and adductors. Fast (white) muscle cells contract fast and have great force production. However, the endurance level is weak and they fatigue really quickly. Fast muscle cells' work is anaerobic because they do not use oxygen as energy. These kind of muscles are motoric, change posture and function as flexors and

lateral muscles. Person who has a lot of red muscle cells does a lot better in endurance sports and person with a lot of white muscle cells does better in power and strength sports. In strength training, endurance type of circuit training with a light load targets more effectively slow (red) muscle cells. Maximal and speed power training develops fast (white) muscle cells. Short strength performance works fast muscle cells but if the performance of the exercise prolongs, it emphasizes more and more the slow muscle cells. (Kauranen & Nurkka 2010, 123-124; Aalto et.al. 2014, 27-28.)

### 3.2 Motor units

Motor unit consists of motor neuron and its innervated muscle cells. The main function is to transfer compulsions from central nervous system to muscles, stimulate muscles to contract. The muscle cells contract with an all-or-none principle, when a stimulus triggers an action potential in the motor neuron, all of the accompanying muscle fibers contract. (Aalto et.al. 2014, 27; McArdle, Katch & Katch 2000, 308.) Muscle action activates motor units in the muscles. In order to increase muscular force, motor units need to be recruited. Low force action activates few motor units and higher action recruits more units. (D. McArdle et.al. 2000, 309.)

### 3.3 Different forms of muscle contraction

Muscle action is divided into dynamic and static form, depending on the changes of muscle length. During the dynamic action muscle either shortens or lengthens. Shortening of the muscle is called concentric action and lengthening of the muscle is called eccentric. Static muscle action is called isometric, the muscle length does not change even when the tension varies or changes. (Kauranen & Nurkka 2010, 139.)

In **concentric contraction**, also known as positive contraction, occurs when muscles generate enough force to overcome inertia and lift the load. The muscle shortens and pulls the insertion of the muscle towards to the origin of the muscle. The



lifting phase in resistance training is a concentric muscle action. In **eccentric contraction** the muscle lengthens, it occurs when the weights are lowered to the starting position. The eccentric action is also known as a negative contraction. **Isometric contraction** is a static contraction. There is no shortening of a muscle or visible muscle movement of body or limb. The muscle's insertion and origin points do not approach each other. Holding a weight stationary or trying to lift a heavy weight are isometric contraction. (Viljoen 2003, 18.) **Plyometric muscle action** occurs when muscle is stretched quickly and then shortened, also known as stretch-shortening cycle. Plyometric action of muscle is combination of eccentric and concentric contraction. In resistance training, plyometric actions are used to develop explosiveness and power, for example box jumps. (Viljoen 2003, 19.)

### 3.4 Energy production in muscle work

Energy production is separated into anaerobic and aerobic. In aerobic muscle work energy is formed with oxygen, therefore the body is able to use fat storages as an energy source. Anaerobic energy production (anaerobic glycolysis) enables muscular action for about 45 seconds, the anaerobic glycolysis occurs without oxygen, therefore, majority of the energy is produced from the blood sugars and glycogens (carbohydrate) stored in the muscles and liver. As the level of the training increases, oxygen is consumed even more and carbohydrates used as an energy. When the anaerobic threshold has been passed, breathing starts to be gasping and lactic acid accumulates to the muscles which causes the fatiguing of the muscle. Therefore, performance cannot be continued anymore for a long period of time, this is when the training changes into anaerobic training (without oxygen). As the muscle action continues even longer, ATP is formed using body's fat storages as energy. In order for the muscular action to continue for a long period of time, the intensity of the exercise needs to be low. (Aalto & Seppänen 2012, 43; Hiltunen & Paakkunainen 1990, 11-12.)

Muscle gets commands from central nervous system (brain, spinal cord) and emanates through peripheral nervous system as an electric impulse. Nerve cell transmits electric impulse that launches chemical reaction in nerve-muscle joint where

neurotransmitter (acetylcholine) is released and emanated into muscle cell's receptors. This triggers potassium flow into the cell and releases energy intermediate (ATP) and muscle contraction. In longer term exercising, along with energy intermediates (ATP, PCr), also muscle's glycogen (carbohydrate) storages and fat storages are needed. (Aalto et.al. 2014, 59.)

In order for the muscle to contract, it needs energy from sugars, fats and proteins. Body converts these compounds into ATP (adenosine triphosphate). Muscle does not contract without ATP. There are small amounts of ATP stored in the muscles but these storages are enough only for a couple seconds of muscular contraction. In order to continue the muscle action, ATP needs to be formed in other ways. Fastest way is to use muscle's PCr (Phosphocreatine) storages, intramuscular energy storages. These two phosphates, ATP + PCr stored within muscles work as a rapid energy supply for short duration and high intensity performances, such as explosive jumps and throws etc. (D. McArdle et.al. 2000, 125.)

### 3.5 Muscle groups

Muscles can be separated into groups (figure 3.) according to their main functions: Extensors – straightening of a joint, for e.g. quadriceps. Flexors – bending of a joint, for e.g. biceps brachii. Abductors – brings a limb away from the middle line of the body, for e.g. triceps brachii. Adductors – brings a limb towards to the middle line of the body, for e.g. pectoralis major. Supinators – rotates a limb outwards, for. E.g. supinator. Pronators – rotates a limb inwards, for e.g. pronator teres. (Viljoen 2003, 20-21; Hiltunen & Paakkunainen 1990, 13-14.)

In resistance training muscles should be trained equally and the training program should always include exercises for all the muscle groups. Evenhandedness is important because of the muscular balance which has straight impact on muscle coordination and posture. Poor muscular balance increases the risk of injuries during exercising. However, if some muscle group has not developed equally, the concentration should be on strengthening the weaker muscles. In resistance training the muscles can be separated into main groups: Middle body (abdomen and

lower back). Thigh muscles, chest muscles, shoulders, upper back and upper arm muscles. (Viljoen 2003, 20-21; Hiltunen & Paakkunainen 1990, 13-14.)

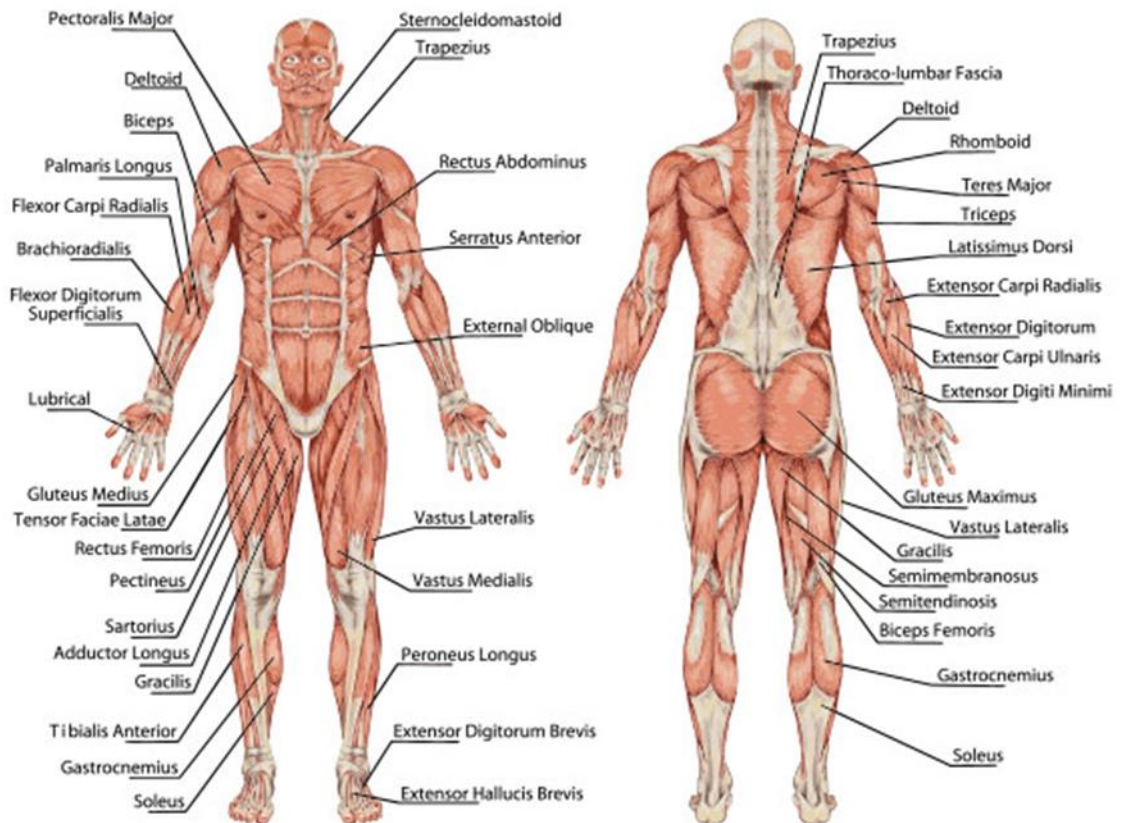


Figure 3. Anatomical position & main muscles in resistance training. (Algonquin College 2012).

### 3.6 Muscular strength

Muscular strength can be separated into three different categories: Strength endurance, which can be separated into aerobic muscle endurance and anaerobic strength endurance. Maximal strength, which can be separated into hypertrophic basic strength and maximal strength. Speed strength and Explosive strength. (Niemi 2006, 95.)

### 3.6.1 Muscle endurance & Strength endurance

Strength endurance is the ability to maintain muscular force for extended period of time. Strength endurance can be separated into aerobic muscle endurance and anaerobic strength endurance. Muscle endurance is training with light loads about 40% of maximum weight and long sets, over 15 repetitions. The recovery time should be short, about 30 seconds. Circuit training and bodyweight training are examples of strength endurance training. Muscle endurance should be considered if the aim is to tone the body, weight control, muscular endurance or rehabilitation, for instance. Muscle endurance is aerobic training that enables to use fat storages as an energy source. Strength endurance develops strength and endurance at the same time, hence the name. Loads in training should be about 40-60% of maximum weight. Repetitions should be pure 12-15 with 30-60 seconds recovery time. Strength endurance should be considered if the aim is to gain strength or body modification, toning, muscular balance and weight control, for instance. Strength training accumulates lactic acid to the muscles, therefore it is anaerobic strength training. (Aalto & Seppänen 2012, 43-44.)

### 3.6.2 Hypertrophic Basic strength & Maximal strength

Basic strength (hypertrophic training) is the best for body modification and gaining muscle mass. It requires hard and progressive training, sufficient amount of nutrients (calories), sleep (muscle grows in rest) and muscle conditioning. Genetics have remarkable impact on how hard it is to build up muscle mass. When the aim is to gain muscle mass, the training has to be extremely effective. Load has to be big enough, about 60-80 % of maximum weight, so that the final repetitions are really hard. Repetitions should be around 8-12 and recovery time about 1-3 minutes. The trained muscle group should be completely exhausted during the training. Especially the eccentric phase should be emphasized because it causes microscopic tearing in muscle fibers. As the damages in the muscle fibers are healed due to the increased protein synthesis, the size of the muscle and strength grows. (Aalto & Seppänen 2012, 45-46; Aalto et.al. 2014, 79.)

Maximal strength means the highest force that athlete can perform during a maximum muscle contraction by the neuromuscular system. Maximal strength refers to the heaviest load that can be lifted in one attempt. Maximal strength requires a good base and knowledge in resistance training technique, therefore beginner or regular trainer should not train maximal strength because of the high risk of injury as the weight load increases. In maximal strength training the load should be heavy, 80-100% of maximum weight. Repetitions should be around 1-4. The recovery time needs to be long, about 3-5 minutes. (Bompa, Cornacchia & Pasquale 2012, 9.)

### 3.6.3 Speed strength & Explosive strength

In speed and explosive strength the performance of the movement is really fast with light load. The exercise should not be done until exhaustion, only until it still feels good. The speed strength training is most common in athletes' pre competitive and competition season. In speed strength training, the load should be about 40% of maximum and repetitions around 3-8. The exercises are done as fast as possible and the recovery time is long, about 3-5 minutes. In explosive strength the load is 30-60 of maximum with 1-6 repetitions. The movements should be explosive, such as jumps and barbell movements. (Aalto & Seppänen 2012, 46-48; Aalto et.al. 2014, 83.)

## 3.7 Periodization in strength training

Periodization means long term planning of the training. The training should be planned according to the amount of training, intensity of training, change of stimulations in training and divide the training into light and intense training weeks in order to develop. (Hulmi 2016, 50.)

Body gets accustomed to the same type of training quite quickly (adaptation). The more regular training is, the faster body gets accustomed and after that the training does not develop effectively, it only maintains the reached physical condition.

Therefore, training program should be changed regularly, after every 8-12 weeks. When the body gets accustomed to the training program, it should be loaded with new kind of stimulations in training, in order for it to develop progressively. (Aalto & Seppänen 2012, 41.)

Even small changes in the training program are enough for new stimulations. Adding weight in the exercise, new exercises, changing the amount of the sets and repetitions, changing the recovery time, doing the same movement in the machine instead of using free weights etc. are good ways to add new stimulations and challenge the body to improve developing. (Aalto 2005, 15.)

### 3.8 Warm up & Cool down

The body needs to be warmed up before exercising with low impact aerobic activity, for example cycling, rowing or walking. The intensity should be enough to cause light sweating. Duration of the warm up should be about 5-10 minutes. After the warm up, light and short stretches can be done but the main muscles groups should be warmed up before the actual workout. The purpose of the warm up is to increase blood flow to the muscles which helps muscles to contract. Warming up decreases the risk of injuries and improves body's optimal functioning and enables controlled movements. (Viljoen 2000, 23; Aalto et.al. 2014, 63.)

The purpose of the cool down is to remove metabolic wastes and lactic acids that have accumulated to the body during the training and to speed up the recovery process. Duration of the cool down should be about 5-15 minutes with light resistance. Cool down can be for example the same as warm up: walking, cycling etc. During the cool down the heart uses lactic acid as an energy source. Short stretches can be performed straight after cool down. However, if the workout has been really intense and consumptive, the stretches should be done about 2 hours after the training when recovery meal and fluids have been consumed. Too heavy stretching straight after workout can cause damages in the muscle and tendons. (Aalto et.al. 2014, 68; Niemi 2006, 77-78.)

### 3.9 Recovery

Muscles and body's fitness grows in rest, not during the training session. Actually, the training session does the contrary; body's energy storages decrease, muscles and nervous system fatigue, hormonal functions turn into catabolic which means break down of the own tissues. And in theory, everyone is in worse condition after training than before the training session. Exercising and stress consumes the body's energy storages. Exercise always activates a stress and inflammatory reaction in the body. The target of the consumption is energy storages, tissues, neurotransmitters, hormones and electrolytes. At the same time stress hormones and inflammatory transmitters in the body increases. (Aalto et.al. 2014, 113.)

In order to recover, it is important to restore body's hydration after a workout by drinking water, juice or sports drink. Another important thing is to have a snack straight after training that will fill up the energy storages and improve recovery process: carbohydrates and proteins in a form of recovery drink or sandwich, fruit and low fat yoghurt does the same as well. (Aalto 2005, 16-17.)

### 3.10 Super compensation

Training shocks body's equilibrium temporarily. If training session's stimulus is big enough, and the body is getting adequate amount of rest and nutrients, the body over compensates, heals itself in order to endure incoming overstraining condition, caused by training. This super compensation fulfills energy storages and causes an anabolic, repairing hormone functions. This means better performance, muscle growth and strengthening. Usually the training is done when recovered fully from the previous training session, this is very common especially in bodybuilding. If there is not enough stimulus or too unfrequently, or too much stimulus and very often, it is possible that the super compensation does not happen. (Hulmi 2015, 50; Aalto et.al 2014, 113.)

### 3.11 Delayed onset muscle soreness DOMS

Delayed onset muscle soreness (DOMS) is a phenomenon that occurs 12-48 hours after exercising, the muscles are sore or stiff. This muscle soreness is usually felt when starting a new exercise program, changing the routine of exercise, increasing intensity or duration of exercise. Delayed onset muscle soreness is a normal phenomenon that is part of an adaptation process to gain strength, muscular hypertrophy and muscle recovery. DOMS is at its worst within the first two days after exercising and it slowly abates over the next days, but it last up to two weeks to abate. (McArdle et.al. 2000, 422; Waehner 2017.)

Several theories explain DOMS, it may be caused by a microscopic tearing of muscle fibers. Or it may be due to abnormal accumulation of metabolite levels (e.g. calcium) in the muscle cell, which produces more cell damage. The amount of soreness and tearing depends on the type of the exercises and duration of the exercise. Additionally to muscle tearing and metabolites, there can also be swelling and inflammation in the muscle that contributes the soreness. Especially eccentric muscle contractions, muscle lengthening (e.g. downward motion of squat), seems to be causing the most of soreness. However, eccentric contractions are also associated with greater muscle strengthening and growth. (McArdle et.al. 2000, 422; Waehner 2017.)

Using a foam roller after exercising can help reducing the muscle soreness. Warming up before and cooling down after intense workout, performing low impact aerobic exercise to increase blood flow may help to diminish the muscle soreness. Resting and sports massage may help reduce swelling and soreness in the muscles. (Quinn, 2017.) Low impact aerobic training and light stretching can ease out muscle soreness. Anti-inflammatory drugs relieve the pain and reduces the inflammation in the muscles. (Aalto et.al. 2014, 119.)

Vitamin E is an important antioxidant that increases the vulnerability of the cell and tis constituents, it minimizes muscle damage and reduces inflammation and soreness. (McArdle et.al. 2000, 420). Vitamin E can be found in poultry, seafood and vegetable oils, fish liver oils, whole grains, nuts and seeds, green leafy vegetables and eggs, for example. (McArdle et.al. 2000, 74).



#### 4 BENEFITS OF RESISTANCE TRAINING

Muscles are needed in every field of life: in movements, keeping the balance, breathing, eating, cleaning up and regulating the body temperature. Muscles also offer amino acids for maintaining the body's vital functions and therefore helps to survive from a disastrous situation. There are many benefits in strength training: it increases the size of the muscles and strength and therefore improves performance and bone density. Strength training with short recovery time (- 2 minutes) between sets and long repetition sets (+10 repetitions) improves the function of the cardiovascular system and blood's fat levels. Strength training also helps with the ageing related muscle sarcopenia. (Hulmi 2016, 14-15.)

Resistance training affects positively risk factors, for e.g.: insulin resistance, glucose metabolism, blood pressure, resting metabolic rate, body fat and diabetes associated gastrointestinal transit time, heart disease and cancer. Resistance training should include precise controlled movements for each major muscle group and it does not necessarily need to require the use of heavy loads. (Winett & Carpinelli, 2001.)

Strength training enables many changes in body structure, performance and beneficial effects on muscles. The changes vary depending on the training method, intensity of the training, consistency and individual factors, such as the genetics. In addition, nutrition, rest and muscle maintenance has their own impact on the changes. (Aalto & Seppänen 2012, 11.)

Regular training affects in the performance, there are changes in the muscle cell metabolism and neural enhancement. Muscle endurance type of training develops body's ability to carry oxygen to the muscles and remove metabolic waste out of the muscles. Training with heavy loads improves the recruitment of muscle motor units in the muscle work. Changes in the performance can already be expected after couple weeks of training. Consistent strength training changes the body structure by hypertrophy, which is growth of muscle size through increased size of individual muscle cells. The size of the muscle fibers grow, but the amount of muscle fibers does not change. This kind of changes in body structure require harder

work, however, it enables the trainer to build up the body to the desired way. It is harder for females to build up their muscle mass than males because of the unfavorable differences in the hormonal metabolism. Changes in posture, muscle balance and bone strengthening are also included in the structural changes. (Aalto & Seppänen 2012, 11-12.)

Strength training affects positively in physical health: it is a great form of exercise in weight loss, toning, blood pressure problems and diabetes. Active muscle tissue consumes more energy than fat tissue, therefore, the more muscles, the higher resting metabolic rate will be. Training with light weights and long sets improves blood stream and fat metabolism. Therefore, those who have high cholesterol levels or blood pressure should do strength training in addition to aerobic exercise. Well-balanced whole body strength training has positive changes in posture and muscular balance, thus back and neck-shoulder problems will ease off with regular resistance training. Strength training is a good way to relieve stress, improve self-image, self-esteem and body control due to better physical health. (Aalto & Seppänen 2012, 11-12.)

## 5 PROS AND CONS OF FREE WEIGHTS AND MACHINES

It is very crucial to have a correct form and good technique when performing a movement because it increases the effectiveness of targeting a muscle group. Exercise should be performed throughout the entire range of motion in order for it to be effective. Therefore, using the full range of motion verifies maximal motor unit activation in the muscles. (Bompa et.al. 2012, 30.)

Pros of using a gym machine to train muscles: It is much safer for a new gym goer to start by using the machines because they will learn the basic moves easier and the risk of injury is not that high when compared to free weights. The machines are a great way to start. (Virtamo, 2009, 8.)

Exercises that are done with free weights develops body's supporting muscles, balance and improves coordination. Therefore, training with free weights is much more effective and beneficial than training with machines because when using a free weight the load is targeted to multiple joints as doing any sport activity, the range of motion in the movements is much more natural and the muscle stimulation is much stronger. However, when training with free weights, there is a quite big risk of injury. Lack of knowledge in the right technique and performance of the movement increases the risk of injuries. Beginners tend to have problems with back, shoulder and knee joints. Therefore, it is very crucial to learn the right techniques from the start. Muscle strains and sprains are common if there is not enough warming up or if too heavy load is used when training. Free weights do not fit well for special groups, children or seniors. When training with free weights it is also hard to isolate a muscle. (Niemi 2006, 138-139; Aalto et.al. 2014, 137.)

There are many benefits of using a machine to train the muscles: the range of motion in the machines are assisted, therefore it is easy for beginners to isolate a muscle and it is safer to start training using the machines. The injury risk is much lower, therefore machines are good alternative for elderly people and beginners. Machines are good for rehabilitation also. However, the range of motion is not always natural in the machines and the supporting muscles do not get any stimulus, therefore it might not be easy to get the right feeling in the muscle during the

exercise. Machines do not develop the supporting muscles, balance or coordination. (Niemi 2006, 138-139; Aalto et.al. 2014, 137.)

## 6 DEVELOPMENTAL TASK

The purpose of the thesis is to plan and implement a product: gym training guide for beginners. The product contains instructions of how to use the cardio machines, pictures of starting and ending points of exercises (machines and free weights), instructions of the techniques in English and Finnish, and also anatomical pictures of the target muscle group. Target group of the guide is the working aged (15-64).

Aim of the commissioning party EasyFit Oulu Ritaharju is to improve their customer relationship by providing the gym training guide and keep their new customers as they learn how to use the gym equipment and gain confidence to train at the gym.

Objective is to improve and utilize personal training and coaching skills, as the thesis topic will benefit me in my future job as a personal trainer and sport instructor. Additionally, learn to plan and implement a product related to health and fitness and also to cooperate with a big company.

According to the objectives of KUAS Degree of Sports and Leisure Management there are several competences for students. The competences are physical activity, health promoting physical activity and coaching, pedagogy and didactics and areas of physical exercise involving leadership and enterprise.

Research questions are:

What are the benefits of resistance training?

What are the different types of strength training?

What is the right form when performing the movement?

How to use the cardio machines?

## 7 THESIS PROCESS

The thesis started by the interest of doing the thesis of a topic that would benefit me in my future job as a personal trainer and sport instructor and what I am really passionate about: gym training. I contacted my commissioning party and they suggested me to do a gym machine guide.

The thesis topic is related to my future job as personal trainer and sport instructor. It is related to my own experience in gym training and supports my previous experience of practical training in a gym.

The main idea of the thesis was to do a guide of how to use the gym equipment with pictures of ending and starting points and also both description of how the movement should be performed and which muscles the exercise affects. This was done both in Finnish and English. The knowledge acquired is mainly academic including fields of sport medicine, physiology and anatomy.

Initial assumption is that the customer does not know at all how to use the machine or how to perform the movement, nor anything about muscle anatomy. Therefore, the guide was done in a way that it is easy for a beginner to comprehend.

Aim is that the customer will know how to perform the movement correctly with the help of the guide and therefore improve safety. Also the purpose of this thesis is to help customers who are shy of going to the gym to train because they do not know how to use the machines or are not brave enough to ask for help.

Gym training has become really popular in the past few years, therefore it is important that the new gym goers know how to perform the movements correctly from the beginning to prevent any injuries.

## 7.1 EasyFit

The commissioning party EasyFit Oulu Ritaharju is a sport center that offers a versatile gym and group exercise classes. There are about 40 EasyFit sports centers all around Finland that belong the same EasyFit chain. (EasyFit, 2016.)

The aim of the commissioning party is that they want improve their customer relationship by helping the customers and keep the new customers as they learn how to do the movements and use the gym equipment. The commissioning party needed a gym machine guide for the customers that have no previous experience about gym training so that they could help their customers for a start if they have no idea how to use the machines. The commissioning party intends to share the guide in their website as a pdf guide and also as a printed one. Nowadays people are more interested about health and going to the gym and the commissioning party is getting even more new clients that have no previous experience about gym training. Therefore, this thesis will help their customers to learn the basics how to use their equipment.

## 7.2 Planning and Implementing

Production developmental thesis aims for practical briefing, guiding, organizing an event or any action. It can be a briefing guide, safety guidance or environment program. The thesis can also be carried out as an event such as, a conference, exhibition or international meeting, for example. The thesis can be implemented as a book, file, portfolio, leaflet or a website, for instance. (Airaksinen & Vilkkka, 9.)

According to KUAS, it is possible to do a production development thesis and therefore the thesis will be carried out as a product development process. Aim is to create a product in order to improve safety and give people motivation and courage to go to the gym as they gain confidence when they know how to use the machines.

The production process follows the traditional production process, where producing proceeds straightforwardly from one phase to another. The process is seen

as a nonrecurring action, and after being completed is distributed. (LEAP project, 2017.) The process starts out by clarifying the aim: what is the goal of the product (gym training guide) and assessing the customers and commissioning party's needs. Next aim was to chart out the current situation: collecting and analyzing information that works as a foundation for the product. This means agreeing the content of the gym training guide with the commissioning party's personal trainers: what exercises and machines should be included in the guide.

After that comes the implementation of the product: first taking the technique pictures (starting and ending points of an exercise) with the model and pictures of the cardio machines. After that the best pictures are chosen for the guide and then the descriptions of the exercise techniques are written (English and Finnish) in a way that is easy for the target group to understand because they may have only a little or no previous experience of weight training at all. Next, the pictures are edited so that they fit in the pages of the guide and then fitted together with the texts, trying different layouts and choosing the one that would work the best in the guide. Finally, the anatomical pictures are added and EasyFit logo added and introduction written.

Final stage of the production process is the assessment of the outcome: the aim is to recognize possible need of improvement and assessing the final outcome of the product. This is done by sending the product to the commissioning party's manager who will give it to the personal trainers and other professionals for evaluation and approval.

The author (myself) of the gym guide and EasyFit has the copyright to the guide. The copyright of the pictures used in the guide was also given to the model who would use them in her own personal blog.

The commissioning party is responsible for the distribution and marketing of the guide. They intend to market it for the customers in the social media and share it as a printed leaflet and also as a pdf file in their website. It will also be in the use of the EasyFit personal trainers.



## 8 DISCUSSION

According to KUAS, the ethicalness is ensured by obeying the contract by following the timetables and agreed contents of the product and aims. Ethicalness is also obeyed by being honest and avoiding plagiarism. Source criticism, reliability and suitability of the information are part of ethicalness, too. (Kajaanin Ammattikorkeakoulu, 2017.)

Therefore, the reliability and honesty of the thesis process is ensured by choosing materials that are done by professionals in the sports and health –field and avoiding the plagiarism by either translating the material into other language or choosing only the main points and telling them in own words. Also the agreed timetables and contents with the commissioning party were obeyed during the process.

Ethical issue is to make sure there are no other people around when taking the pictures and allowing the commissioning party the copyright so that they can use the thesis as they like. Other ethical issue is to make sure the techniques of the exercises and descriptions of the movements and pictures are correct in order to prevent any injuries on customers.

According to FCCA, customer has the right to know when there are attempts to influence them commercially. Advertisements has to be recognizable despite the way of presenting it or the advertising channel. (FCCA, 2017.) Therefore, the clothes that the model is wearing during the photoshoot include the logos of the commissioning party in order to avoid hidden marketing of a certain clothing brand.

The reliability is ensured by planning out the production process. The process started out by assessing the customers and commissioning party's needs: the machines and exercises are chosen in cooperation with the commissioning party, taken into account the customer target group beginners. Also by agreeing the content of the gym training guide with the commissioning party's personal trainers.

The reliability and ethicalness of the final product is ensured by the evaluation and approval of the EasyFit personal trainers and other professionals, so that the pic-

tures are good enough to demonstrate the exercises correctly and that the description of how the exercise should be done are correct in order to prevent injuries.

Ethicality and reliability was reached well, there are no other people shown in the pictures of the guide, only the model. Copyrights are given to the commissioning party and the copyright of the pictures is given to the model, too. The model of the pictures is wearing a t- shirt which has EasyFit logo in order to avoid hidden marketing. As the final version of the guide was approved by the EasyFit personal trainers, the pictures, forms and technique descriptions of the exercises were verified to be correct and reliable. The reliability was reached by using different sources of material that is written by professionals in the sports and health field. Furthermore, the agreed timetables and contents of the product development process with the commissioning party were obeyed during the process.

According to the objectives of KUAS Degree of Sports and Leisure Management there are several competences for students. The competences are physical activity, health promoting physical activity and coaching, pedagogy and didactics and areas of physical exercise involving leadership and enterprise.

Overall, the thesis process deepened my competences in almost every area: I developed my knowledge health enhancing physical activity and coaching as I really had to think how to explain a certain exercise technique to someone who has no previous experience about gym training. This will help me in the future because I will have a lot of customers with little or no previous training experience when working as a personal trainer. The process also enhanced my pedagogical and physical activity competences as I had to write the technique descriptions and introduction to the guide. During the process I gained a lot of confidence and courage by acquiring a lot of new information about physiology and anatomy and deepening the previously acquired knowledge. It helped me to start my practical training bravely. Additionally, I learned about cooperation with a company and how to develop a product that is related to sports and health.

All in all, the aims and objectives of the product development process were reached successfully, I got to utilize and improve my own skills of gym training and

instructing. Additionally, the personal trainers of EasyFit got themselves a gym guide that helps them to improve the customer relationship, and I learned to plan and implement a product that is related to health and fitness and cooperation with a company.

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## **Vocabulary**

Flexion = bending a joint, decreases the angle between two parts of the body. Flexion occurs in the sagittal plane.

For example, bending leg at the knee, so that foot is raised behind.

Extension = straightening of a joint, increases the angle between body parts. Extension occurs in the sagittal plane.

For example, straightening of a leg at the knee so that the foot is lowered into a standing position.

Abduction = moving a limb away from the midline of the body.

For example, raising arm upwards and away from the body.

Adduction = moving of a limb towards the midline of the body.

For example, lowering arm towards the body.

Rotation = movement of the limbs around their long axis. Rotation is either medial or lateral.

Medial rotation is rotational movement towards the midline of the body.

Lateral rotation is rotational movement away from the midline of the body.

For example turning foot inwards or outwards as it rest on the floor.

Circumduction = combination of flexion, extension, abduction and adduction. Circular motion a distal part of a limb.

For example, making circular motions with arms.

(Aalto et.al. 2014, 23; Algonquin College 2012.)

Repetition = separate movement, for example squatting down and coming back up, that is one repetition. How many times certain movement is done.

Set = consists of one or multiple repetitions, example doing squats of 12 repetitions. That makes a one set.

1RM = one repetition maximum, the maximum amount of weight that can be lifted only once for any exercise.

ROM = range of motion.

(Aalto et. al. 2014, 69-70; Viljoen 2000, 114-115.)







