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“Exercise Was Just a Way of Modifying My Body.” Exercise Dependence and Orthorexia among Students in Kainuu Region: A Qualitative Study

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<p>The purpose of the thesis was to describe exercise dependence and orthorexia as a phenomenon, the possible correlation between the addiction and a disorder, the self-image of an exercise dependent and the reasons behind the dependence and possible disorders.</p> <p>The study was implemented as a qualitative study, where the participants were interviewed and the data analysed with the qualitative content analysis.</p> <p>The theory part of the thesis consists of the basic understanding of addictions and specific information about exercise dependence and orthorexia, and other related eating disorders.</p> <p>In the conclusion it can clearly be seen, that despite the fact that exercise dependence and especially orthorexia have not been researched nor recognized as true addictions or disorders, a correlation between these two is obvious. This thesis supports the conclusions of previous researches on exercise dependence and indicates that a correlation between exercise dependence and orthorexia is true.</p>	
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<p>Opinnäytetyön tarkoitus oli tutkia, onko liikunta-addiktion ja ortoreksian välillä yhteyttä, millainen on liikunta-addiktin minäkuva ja mitkä syyt ovat addiktion ja mahdollisen syömishäiriön takana.</p> <p>Tutkimus suoritettiin laadullisena tutkimuksena, jolloin opinnäytetyöhön osallistuvat henkilöt haastateltiin ja aineisto analysoitiin aineistollisen laadullisen tutkimuksen ehdoin.</p> <p>Opinnäytetyön teoriaosuus käsittää perusteet addiktioista, ja keskittyy liikunta-addiktion, sekä ortoreksian kuvaamiseen. Teoriapohjassa sivutaan muita mahdollisia syömishäiriöitä.</p> <p>Opinnäytetyön tulokset tukevat edellisiä tutkimuksia liikunta-addiktiosta. Selvä yhteys liikunta-addiktion sekä ortoreksian välillä on nähtävissä, vaikkakin tutkimuksia aiheesta on tehty verrattaen vähän, eikä kumpaakaan ei virallisesti ole nimetty addiktioksi, tai syömishäiriöksi.</p>	
Language of Thesis	Englanti
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ABBREVIATIONS

AN	Anorexia Nervosa
APA	American Psychiatric Association
BOT	Bratman's Orthorexia Test
BMI	Body Mass Index
BN	Bulimia Nervosa
DSM	Diagnostic and Statistical Manual
EAI	Exercise Addiction Inventory
ED	Exercise Dependence
EDQ	Exercise Dependence Questionnaire
EDS	Exercise Dependence Scale
NCCMH	National Collaboration Centre for Mental Health
OCD	Obsessive-Compulsive Disorder
ON	Orthorexia
WD	Withdrawal
QEQ	Obligatory Exercise Questionnaire

1 INTRODUCTION

“We live in an overstimulating society and rapid advances in technology and abundant availability to stimuli and resources may play a role in the increased prevalence of behavioural disorders” (Karim & Chaudhri 2012, 14). The image of an ideal body is emphasized alongside with a healthy lifestyle and eating habits through the mass media. These images can be triggers for people in all ages and genders to turn fitness into an addiction and eating into disorder. The industrial development offers resources such as food and fitness centres accessible in a manner never seen before. *High quality* foods including organic and raw foods have become a trend that can lead to a path of orthorexia, i.e. excessive healthy eating. The *ideology* of the fitness centres is to regard the body as a project by modifying weight or body shape and improving physical performance (Eriksson, Baigi, Marklund & Lindgren 2008, 389-390; Karim & Chaudhri 2012, 7; Santala 2007, 21-22.)

Exercise dependence, i.e. exercise addiction, was first used to describe overcommitment among runners. Dependence was first regarded as a positive addiction because of the psychological and physiological benefits, but the term of positive dependence was later modified into physical activity. Exercise dependence has yet failed to reach neither the diagnostic criteria nor the criteria to be classified as an addiction. However, it is recognized in the field of sports among non-athletes and athletes and some clinical psychologists. Exercise dependence is classified as a craving for leisure time exercises that become uncontrollable and repetitive exercises that consume a significant amount of time an exercise dependent is unlikely to take rest days and the addiction might cause conflicts in social relationships (Allegre, Souville, Therme & Griffiths 2006, 631-634; Kerr, Lindner & Blyden 2007, 1, 7-8, 18; Hamer & Karageorghis 2007, 477; Weik & Hale 2009, 204.)

Orthorexia is an eating disorder emphasizing the purity and quality of food, rather than the quantity. An orthorexic pursues the physical feeling of lightness. The aim of an orthorexic has first been to improve ones own health, weight control or ease the symptoms of a chronic disease. Eventually, the focus becomes an obsession and the orthorexic spends a great amount of time for planning, purchasing, preparing and eating meals. Orthorexia itself rarely causes any physical damage however the constrained lifestyle and separation from social situations can cause emotional damage. In worst cases orthorexia can lead to more severe eating disorders such as anorexia and bulimia nervosa. It is common that an orthorexic follows

a strict diet and sometimes patients recovering from anorexia find a form of orthorexia relieving, because of the compulsive behavior over food (Bratman 2000, 2, 10, 19, 26; Santala 2007, 31-32.)

The purpose of the thesis is to describe exercise dependence and orthorexia as a phenomenon, the possible correlation the addiction and the disorder, the self-image of an exercise dependent and the reasons behind the dependence and a possible disorder. The aim of the thesis is to provide knowledge concerning the wellbeing of students (athletes and non-athletes) in Kainuu region. The topic is current as the fitness industry is constantly growing while the *ideal* body image is changing. There are only a few previous studies made concerning exercise dependence and orthorexia in Finland but exercise dependence has been researched more in the United States. A common concept for the previous studies is the definition of exercise dependence or the measurement tools to diagnose it but only a few are made about concerning the wellbeing of exercise addicts.

2 ABOUT AUTHORS PRE-UNDERSTANDING AND IDEA OF MAN

Within the authors closest circle there has been cases of over-exercising and exaggeration of healthy eating habits, which have shown signs towards exercise dependence and perhaps even orthorexia. These cases got the author interested about exercise dependence and orthorexia as a phenomenon, as the author has followed the developing fitness and dietary trends in the mass media with interest.

Authors' idea of man is based on individuals' self-image; whether the person has a positive or somehow negative self-image the thoughts of an individual are affected by the environment and mass media. If an individual has more of a negative self-image, the effects of surrounding trends are greater. The author focuses on the self-image of ones physical appearance.

3 ADDICTIONS

“Life is a series of addictions and without them we die. They have varying time-scales. Every few moments we inhale air. If deprived of it, within seconds we strive to breath, with immense relief when we succeed” (Behavioral addictions 1990, 30). These normal biological cycles of life, such as eating, drinking and sleeping, are much like substance addictions that we crave in order to live. On a longer time scale, the basic needs involve rising desires to perform a certain act. If the act cannot be completed, an individual often starts to experience symptoms of withdrawal (WD). As the act is performed, the desire is switched off but will return within hours or days. (Adams & Kirkby 2002, 425; Behavioural addictions 1990, 1389-1393.)

The term addiction can be defined in many ways. A primary definition has traditionally been the abuse of drugs. However, it has been argued that an addictive state can also be caused by specific behaviours, but critics have reported that the classification of behavioural addictions may blur the line between true addiction and excessive bad behaviour. It has been stated that inclusion of behavioural addiction may *medicalize* excessive bad behaviour, creating challenges in identifying an addiction from normative rituals of behaviour. Yet excessive behaviour cannot simply be defined by *excess*. (Karim & Chaudhri 2012, 5; Phillips 2006, 30-31.)

“Surprisingly, there is still no scientific consensus about how to define substance addictions, let alone behavioural ones” (Phillips 2006, 30). Addiction depends on decision making and individual or environmental motivations towards decisions; repetitive routines of a certain act are not called addictions until the frequency or an intensity of a handicap. Whether the addiction is towards a substance or an act, both have onset in adolescence and young adulthood. (“Behavioral addictions” 1990, 1389; Grant, Potenza, Weinstein & Gorelick 2010, 234; Heyman 2009, 115-116; Karim & Chaudhri 2012, 7; Kerr et al. 2007, 24.)

Personalities of substance and behavioural addicts are alike, as individuals from both classifications of addictions score high on self-report measures of impulsivity and sensation seeking and low in measures of harm avoidance. Behavioural addicts differ from substance addicts as individuals score high also in measures of compulsivity. In both classifications the individuals suffer from financial and marital problems as the object of their addiction is the main priority in life (Grant et al. 2010, 234; Karim & Chaudhri 2012, 6; Kerr et al. 2007, 25.)

3.1 Substance Addiction

As stated, substance addiction is an addiction towards a certain substance or chemical, and is not unlikely to have multiple addictive attractions. Use of substances causes neuroadaptation, as the chemical pharmacologically *hijacks* the body's *reward system*, adapting the feeling of *high* given by the substance. As the body adapts to the substance, the definition of tolerance broadens meaning that in time greater doses are needed in prior to the same kind of high. (Behavioral addiction 1990, 1391-1393; Grant et al. 2010, 233-234, 236; Karim, Chaudhri 2012, 6-7; Phillips 2006, 30-35.)

“Individuals with substance addiction report difficulties in resisting the urge to drink or use drugs” (Grant et al. 2010; 243). Substance abusers often become also behavioural addicts as they become addicted not only to the substance, but for the routine of preparing and administering it (“Behavioral addiction” 1990, 1392).

If the craving(s) a substance is not fulfilled, WD symptoms often appear. The symptoms can vary from excessive moodiness, irritability, nausea, stomach cramps, headaches, and sweats all the way to psychological symptoms that can be medically serious. Substance addiction is easy to stop spontaneously but often just for a short period of time (Behavioral addiction 1990, 1392-1393; Phillips 2006, 31.)

3.2 Behavioural Addiction

In contrast to substance addiction behavioural addiction has a behavioural focus. Behavioural addiction has historically been phrased as impulse control disorders, out of control behaviours but is established to be referred as behavioural addictions or non-substance addictions. It is also been presented along side with the obsessive control disorders (OCD) and mental disorders. (Grant et al. 2012, 233, 237; Karim & Chaudhri 2012, 5; Richardson 2012b.) Behavioural addictions have not yet reached the DSM-III, DSM-IV or DSM-V (Diagnostic and Statistical Manual of Mental Health, third, fourth and fifth edition) criteria created by the American Psychiatric Association (APA) (Grant et al. 2012, 233; Karim & Chaudhri 2012, 7, 14; Kerr et al. 2007, 5).

“The essential feature of behavioural addictions is the failure to resist an impulse, drive, or temptation to perform an act that is harmful to the person or to the others” (Grant et al. 2010, 234). Addictive behaviours are often used to release tension and lessen anxiety in prior to the *high* mentioned in the previous chapter. Behavioural addicts often describe feelings of tension or arousal before committing the addictive behaviour and pleasure or relief after committing the act. A behavioural addict is often preoccupied by addictive behaviour and has no ability to control behaviour or excessiveness. A Highlighted aspect of behavioural addiction is that given the right exposure and timing, any individual has the potential to be an addict. (Grant et al. 2010, 233-236 ; Karim & Chaudhri 2012, 5-6, 14; Phillips 2006, 32.)

Behavioural patterns are mostly learned actions that are reinforced over a time by the mechanism developed by the human brain. This reinforcement has been defined as the mesolimbic reward system. The reward system regulates *rewarding behaviours* that are carried out through motivation. (Grant et al. 2010, 236; Heyman 2009, 116; Karim & Chaudhri 2012, 6-7.)

The craving towards addictive behaviour is triggered by memory, and the memories are created by learning. Behavioural addiction is evolved alongside the pleasure or the reward system, so the behaviour provides memories of rewarding and aversive stimuli. The addiction can be so powerful that despite the negative consequences behavioural patterns must be preserved. As the behaviour is repetitive the feelings of anxiety, stress, and WD are more likely avoided. Unlike in substance addiction, behavioural addicts have not reported any symptoms of WD as medically serious. As in substance addiction, also the behavioural addictions are easy to quit for a while. (Behavioral addictions 1990, 1389-1392; Grant et al. 2010, 233-235, 237 ; Karim & Chaudhri 2012, 6-7; Kerr et al. 2007, 20.)

3.3 Neurological Rewarding System

There has been evidence of common neuroadaptation with substance and behavioural addiction, as there is with the rewarding system. In the following paragraph the neurological process and the rewarding system is briefly described. The rewarding system process is briefly discussed, mostly concerning the behavioural addiction model (Behavioural addictions 1990, 1391-1392; Grant et al 2010, 235-236; Karim & Chaudhri 2012, 6-7.)

Rewarding behaviours are mostly influenced by the dopaminergic and endogenous opioid system. Dopamine is a neurotransmitter in the brain that creates the sensation of satisfaction and pleasure. It has been investigated that dopamine creates similar sensations of *high* as amphetamine and cocaine. The effect is due to the effect of reducing the re-uptake after the release of dopamine. As the dopaminergic system releases dopamine, the endogenous opioid system creates a feeling of euphoria, much equivalent to the *high* created by dopamine. The endogenous opioid system releases β -endorphins. β -endorphin is a neurotransmitter such as dopamine, but is an opiate-like substance that is produced within the body. Opiates are known to relief pains and to increase pain threshold (Adams & Kirkby 2002, 415-425; Hamer, Karageorghis 2007, 480; Karim & Chaudhri 2012, 6.)

3.4 Treatment

Both substance- and behavioural addiction are such conditions that often require medical attention, but there are cases of individuals who have recovered from these addictions on their own. This is called the *spontaneous* quitting (Grant et al. 2012; Kerr et al. 2007). In the medical field, both substance- and behavioural addicts often response to similar treatments, both psychosocial and pharmacological. In substance addiction pharmacological treatment is an effective way to rehabilitate the individual from the primary substance of addiction, however, there is a risk with medical treatment in substance addictions the individual can replace the previous substance and become addicted to the treatment. For behavioural addiction there are no approved medications in treating the addiction but evidence indicates that some behavioural addicts have responded well to the medical treatment used in substance addiction (Behavioral addiction 1990, 1392-1393; Grant et al. 2010, 236-237.)

In substance addictions there are therapies such as 12-step self-help approach, motivational enhancement, and cognitive behavioural therapies that are all form of therapy, and the basis is on the individual have commonly used to treat behavioural addictions successfully. For both addictions also psychological interventions and relapse prevention models have been used to treat the addiction (Grant et al. 2010, 236-237.)

In early stage of both addictions, a self-exposure method/therapy can be used in order to treat the addiction. Self-exposure method bases on individuals realization that the addiction is a treatment for anxiety and other WD symptoms, and the effect is temporarily. In the ex-

posure therapy, an individual is exposed to the WD symptoms in order to brake the addictive cycle. As the exposure might set off panic attacks, and extreme discomfort the therapy must be voluntary. For an individual to learn to brake the addictive cycle to endure the WD might take days or more to cope with (Behavioral addiction 1990, 1392-1393.)

4 EXERCISE DEPENDENCE

“The term exercise dependence was first used to describe cases of overcommitment” (Allegre et al. 2006, 631), as committed individuals would arrange exercise around their lives, and dependent individuals would arrange their lives on the conditions of exercise. Behavioural addictions are not often referred as addictions, but more as compulsions, as the term addiction more implies attraction towards something. The term Exercise Dependence (ED) is preferred as it does not refer to any particular sport (Allegre et al. 2006, 631; Behavioral addictions 1990, 1391; Cockerill & Riddington 1996, 119-120; De Coverley Veale 1987, 735.)

At first ED was considered to be a *positive addiction* due to the psychological and physiological benefits of exercising, being a stimulant leading to physiological arousal and occasionally reaches a state of euphoria. In this positive dependence model there was an assumption that dependency does not dominate individuals' life and decisions and cause symptoms of WD. The consequences of positive ED were considered as beneficial. This model was tested using a sample group of 12 male runners, and who were tested on psychological or physiological dependence, carrying out a study where the runners were not to fulfil their usual running regimen. For all of the participants, the breaking of their normal running regimen produced WD symptoms such as anxiety, guilt, restlessness, and irritation. Several other studies were made to research positive dependence but it was further modified to meet a concept now known as physical activity (Allegre et al. 2006, 631-635; De Coverley Veale 1987, 735; Kerr et al. 2007, 7-8, 18-21, 24-25.)

ED is a behavioural addiction that occurs when an individual does not consider any harmful effects, but chooses to exercise once or more daily, despite the negative consequences such as injury or illness. In fact ED is presented as most likely to occur as a persistent injury (De Coverley Veale 1987, 736). As the behavioural addictions in general, ED was first classified in the group of OCD. The criterion for ED has developed so it can be diagnosed if the condition meets the certain criteria. The criterion includes tolerance, symptoms of WD, intention effects, loss of control, time, conflict, and continuance. Tolerance is a process where the amount and intensity of the training are increased prior to reach former effects and *euphoria*. WD symptoms (e.g. anxiety, insomnia, restlessness, and irritability) are psychological or physiological symptoms that occur from 24 to 36 hours from the previous exercise. Intention effects, i.e. salience, mean that the action has become the main priority in an individuals'

life, interfering with social relationships and occupational circumstances, as loss of control refers to the inability to quit exercise at any given time. Time refers to the great amount of time spent by exercising and conflict reflects the occupational, social (family, friends) and other activities decreased because of exercise. Continuance is the repetitive pattern of the act, without ability to cut down the exercises (Allegre et al. 2006, 631-632; Cockerill & Riddington 1996, 120-121; Kerr et al. 2007, 7-9, 18; Keski-Rähkönen 2001, 280; Richardson 2012b; Weik & Hale 2009, 204.) As ED provides short-term rewards, the relapse circle of addiction is relatively easy to get into. If the addiction becomes fully established, the act would control individuals own thinking, feelings and behaviour towards the activity (Adams & Kirkby 2002, 415-416; Grant et al. 2010, 233-234; Hamer & Karageorghis 2007, 478-482 ; Karim & Chaudhri 2012, 6; Kerr et al. 2007, 24, 41, 48 ; Richardson 2012a.) The prevalence of ED is unknown (De Coverley Veale 1987, 736). There are not significant differences found on gender, age, years of exercising, length of exercise, and typical number of weekly exercises. The only differences to be found are that exercise motivation are that women are mostly socially and body image centered, in contrast to men who seem to be dependent mostly to the regimented, behavioral routines and the consequences for exercise (Weik & Hale 2009, 206).

ED is generally addressed as it is, but it has been divided into two classification groups: Primary ED and secondary ED. More advanced definitions are provided, when primary ED is divided into subgroups consisting of primary ED based on diagnostic criteria and primary ED based on behavioral components of addiction. However, if the classification groups are used, often primary ED has been used as a one concept despite of the subgroups and the two subgroups are only briefly gone through (Allegre et al. 2006, 633-643; Cockerill & Riddington 1996, 121-122; De Coverley Veale 1987, 737-738; Kerr et al. 2007, 46-47, 90, 98-110.)

4.1 Primary Exercise Dependence

“For primary ED, the physical activity is an end in itself.” (Hamer & Karageorghis 2007, 477) Primary ED can only be diagnosed, if anorexia and bulimia nervosa are first being excluded so the classification is independent (i.e. primary) without the *double dependency* Individuals with primary exercise dependence seem to adapt to their environment by finding an

occupation that is physically active, remain single or adopt partners that put up with the time consuming ED. These individuals do not think they have an addiction since they are so well adapted to their environment, and are unlikely to seek psychological help. Primary exercise addict is unable to function only when injury or illness prevents the exercise (Allegre et al. 2006, 640-643; Cockerill & Riddington 1996, 119-123; Kerr et al. 2007, 46.) Individuals with primary ED are often found to score high on neuroticism, extraversion, and agreeableness. Further research has predicted these three factors to be significant predictors of primary ED. In contrast to secondary ED primary dependents seem to have more positive attitude towards exercise, they do not avoid arousal as much, are less focused on planning and achieving their future goals, thus the situation is different in athletes: Athletes with primary ED are more serious about exercise, goal orientated and self-focused (Kerr et al. 2007, 99-100, 103, 106.)

There is no clinically validated diagnose of primary ED so its existence is often questioned. However, it is believed that primary ED does exist, but is quite rare (Veale n.d, 1-2.) Even the earliest studies that tended to be running-specific had an aim to primary dependence, thus the term was not recognized yet (Keski-Räyhkönen 2001, 281).

Primary ED is based on diagnostic criteria for substance dependence. The criteria are the same than in the generalized ED (tolerance, WD, lack of control, time, reduce of other activities and continuance) (Allegre et al. 2006, 632, 634; Kerr at al. 2007, 7-9; Keski-Räyhkönen 2001, 280.)

Primary ED is based on behavioural components of addiction is defined as “a repetitive pattern that increases the risk of disease and/or associated personal and social problems.” (Allegre et al. 2007, 624) The core of criteria for behavioural components is same as in the general assumption of ED; salience, mood modifications, tolerance, withdrawal, conflict and relapse (Allegre et al. 2006, 632, 634; Kerr at al. 2007, 7-9; Keski-Räyhkönen 2001, 280.)

4.2 Secondary Exercise Dependence

Secondary ED is much like the general definition of ED or primary ED, but is classified to emerge with an eating disorder. Secondary ED differs from primary ED so, that the exercise itself and the euphoria caused by it is not the main reason for the exercising; Often individu-

als with secondary ED wish to lose weight or to control their body size or shape, balancing with calories and is associated with a fear of fatness. The excessive exercise is considered to be secondary towards weight loss or the balancing the intake of calories (Allegre et al. 2006, 636-640; De Coverley Veale 1987, 737-738; Kerr et al. 2007, 103.) “The exercise may reach a state of dependence but it is still regarded as secondary to the eating disorder” (De Coverley Veale 1987, 738).

Secondary ED is often referred as double dependency prior to the existence of ED and eating disorder. Individuals with secondary ED tend to be less optimistic towards exercise, are planning orientated and focus to the achievement of the future goals. In the Hong Kong studies by Blaydon and Lindner it was notes that the secondary group had a significantly lower body mass index (BMI) than the control group. As in primary ED, secondary ED athletes are more goal orientated, self-focused, they have a greater need to be in control and avoid unnecessary arousal (Kerr et al. 2007, 103-108.)

4.3 Four Phases of Exercise Dependence

The criteria for diagnosing ED has been listed in the previous paragraphs and the criteria stays unaltered despite the classification groups and their subgroups. As it is mentioned that the addiction can be diagnosed when the symptoms are met and it is clear that the exercising is excessive, however, there is only little mentioned about the process of the evolving of the addiction. In Figure 1 the phases of ED are represented in a simple form (Richardson 2012b.)

Recreational phase consist little or no risk of the negative consequences of exercising. The motivation towards the training emerges from the pleasure gained during the exercises and the established changes in the body. At this point, exercise can be stopped with no or little consequences at any time. This phase is the normative physical activity state, where an individual exercises for the joy of exercising and the appreciation of overall health (Richardson 2012b.)

As moved on to the second phase, at risk exercise, the bodys rewarding system starts to affect the exercises. Dopamine and β -endorphin are released and they create the sense of *high* or euphoria. The reward system giving only short-term relief for stress and anxiety, an indi-

vidual craves more of the act giving the feeling of *high*. Many of the exercise addicts do in fact escape their problems through the craved act. At this stage the motivation no more comes from within, but from the stress (i.e. withdrawal) relieving effects and the addiction is more likely to evolve (Adams & Kirkby 2002, 416-420; Karim & Chaudhri 2012, 6; Richardson 2012b.)

The second phase, at problematic exercise, emerges after the individual uses exercise the only way to relief stress and anxiety. At this point exercise has become repetitive, and the life of an individual is more scheduled in the terms of exercising. If exercise is stopped, the individual will most likely to experience symptoms of WD and the exercise becomes a way to treat these symptoms (Richardson 2012b.)

The last phase is where the addiction has emerged. An individuals' life is scheduled around exercising and social and occupational relationships and responsibilities suffer. Regarding the negative consequences and individual continues to prolong the exercises and increase the frequencies and the intensity, in prior to gain the *high* experienced in the previous exercise. Exercise is acted only so that the individual does not need to experience the symptoms of WD (Adams & Kirkby 2002, 415-418; Richardson 2012b.)

PHASES OF EXERCISE ADDICTION

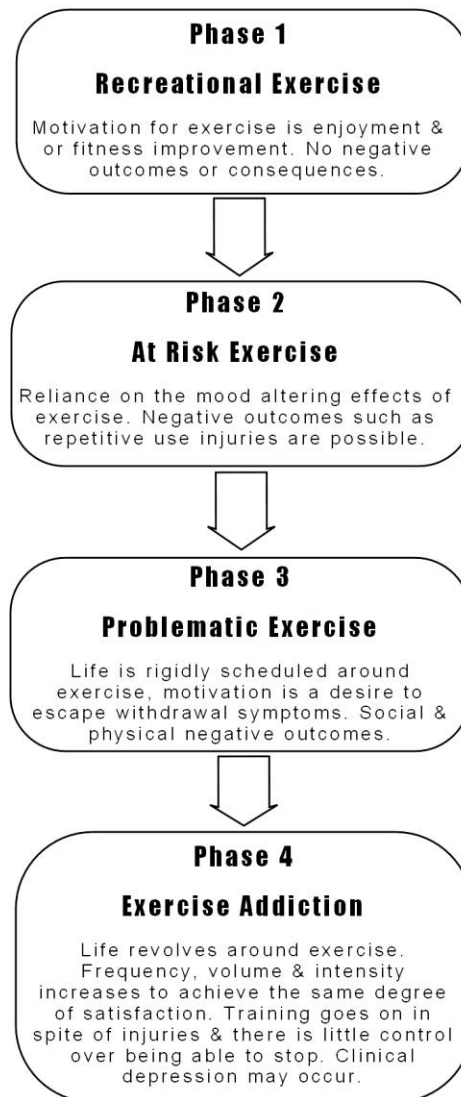


Figure 1. Four Phases Of Exercise Dependence (Richardson 2012b).

4.4 Measurements Of Exercise Dependence

“Many attempts have been made to define and measure problem exercising but there has not been any successful attempt to produce a psychometrically sound assessment instrument.” (Terry, Szabo & Griffiths 2004, 489) The first measurements for ED were running-specific, and most of the researches were done with sample groups that consist of runners or

other endurance sports (i.e. cycling and swimming). Later it has been recognized that ED can emerge in any other sport, such as power lifting and aerobics (Allegre et al. 2006, 636; Kerr et al. 2007, 3-4, 10.) Several questionnaire measures have been developed to measure ED. However, there is criticism about these indirect measures through WD symptoms, and some of the measurements were not theory-driven. As it is complex to define any addictive behaviour and there have been unsuccessful attempt to provide such measurement that can accurately define the dependence, let alone separate primary and secondary ED, there are quite a few of the measurement methods. Most often used are briefly gone through (Terry et al. 2004, 489, 492.)

4.4.1 Obligatory Exercise Questionnaire

Obligatory Exercise Questionnaire (QEQ) was a first validated measurement for ED and it has well established psychometric properties. QEQ is modified from the Obligatory Running Questionnaire, which was first used to assess obligatory and nonobligatory runners. QEQ covers a wide range of exercise behaviour. QEQ is known to have three subscales that are exercise fixation, exercise frequency, and exercise commitment. It consists of 20 items and can also be used in assessment of secondary ED (Allegre et al. 2006, 636-637; Terry et al. 2004, 491-492.)

4.4.2 Exercise Dependence Questionnaire

Exercise Dependence Questionnaire (EDQ) is targeted to differentiate primary and secondary ED by including questions from both categories; ED and eating disorders. The measurement also contains items concerning the WD symptoms. EDQ reflects the motivation to exercise through the fear of WD symptoms, positive rewards, desire to control weight or body shape, and is relevant to all forms of exercise. EDQ consists of 29 items from 8 different subscales that investigate the social affects and motivational factors of exercise. However it has been argued that despite the good reliability of EDQ it assesses more of the social aspects and attitudes towards exercise rather than dependence (Allegre et al. 2006, 639; Kerr et al. 2007, 11; Terry et al. 2004, 491.)

4.4.3 21-Item Exercise Dependence Scale

Exercise Dependence Scale (EDS) is a 21-item measure of ED and has eight subscales that are prior to the diagnosis of ED: tolerance, WD symptoms, continuance, lack of control, reduction of other activities, time, and intention. Using the EDS individuals can be categorized by at risk of dependence, non-dependent-symptomatic, and non-dependent-asymptomatic and can be also used to specify individuals with psychological or physiological dependence. EDS does not differentiate primary and secondary ED. The scale is based on the substance dependence Disorder-IV criteria by American Psychiatric Association and a strong connection is found between EDS and QEQ. EDS has been criticized for its somewhat limited concept of addiction (Allegre et al. 2006, 640-641; Cook, Hausenblas, Tuccitto & Giacobbi 2011, 219; Kerr et al. 2007, 11; Terry et al. 2004, 492.)

4.4.4 Exercise Addiction Inventory

Exercise Addiction Inventory (EAI) is a short form of measuring ED, consisting only six items. EAI is mostly purposed for measurements of primary ED and has cut-off point for individuals in risk of primary ED. In contrast to the other screening tools, EAI is theory-based. It has been cross-validated with Obligatory Exercise Scale and EDS finding them impractical, as they take a long time to administer and are difficult to score. EAI process is still ongoing (Kerr et al. 2007, 11; Terry et al. 2004, 492-497.)

5 ORTHOREXIA NERVOSA

Orthorexia nervosa (ON) is relatively new concept in the field of eating disorders and also controversial. ON was first recognized in 1997 in a publication of Yoga Journal, by M.D Steven Bratman, a doctor in the field of alternative medicine. The term orthorexia comes from Greek words *ortho* meaning right, true or correct; *orexia* meaning eating or an appetite and *nervosa* referring to obsession or fixation. ON emphasizes the extreme purity of ones dietary behaviour. As an anorexic and bulimic fixates to the quantity of food, orthorexic fixated to the quality instead. An orthorexic wants to feel pure and light.. ON is not yet recognized as a disorder by the DSM-IV but is recognised by The Eating Disorder Association of Finland (SYLI ry.) among the most common eating disorders. Unlike anorexia nervosa (AN) and/or bulimia nervosa (BN), an orthorexic does not hide the eating disorder as reach for perfection and often feel superior to other individuals with normal dietary habits (Bratman 2000, 2, 9-10, 21; Santala 2007, 31.)

ON often starts innocently as a desire to improve individuals' dietary habits in order to improve general health, lose weight or relief symptoms of a certain disease. As ON develops, in time, more and more foods are being eliminated from the diet. An orthorexic often feels superior to who eat regarding a normal diet and is proud of the self-discipline possessed. ON can be addresses when "focus becomes obsession, self-discipline becomes self-punishment, and effort itself can turn into an addiction" (Bratman 2000, 19). ON can reach a point when a most of the individuals' time is devoted to the planning, purchasing, preparing and eating meals. Often different diets are executed, for example a diet of consuming 1500 kcal per day. This affects negatively to the social connections of an individual as social gatherings and public meetings become stressful and joyless as the time is spent by thinking dietary aspects. ON can even lead to social isolation due to the stressfulness of the situations and social isolation causes physical damage (Bratman 2000, 9-10, 18, 23, 31, 37-38; McGuire 2010, 47; Santala 2007, 31.)

ON has many similarities with OCD as with behavioural addictions and frequently shares more than one characteristics of addiction; obsession becomes the only way to feel satisfied, narrowing of interests, denial, defensiveness and narrowing of the social circle. Yet ON is not recognised of neither OCD nor addiction but a severe state of a mental illness such as AN and BN In severe cases ON can lead to significant malnutrition exposing the individual

to diseases and infections. In most cases ON seldom leads to death, but in severe cases ON takes similarity to AN and can lead to starvation. There is also evidence that in some cases ON can be a consequence of AN (Bratman 2000, 19, 25-26, 30, 34-; Santala 2007, 31.)

ON does not have diagnostic criteria or a valid measurement, but often an unofficial orthorexia test created by Bratman (2000) is used to identify ON. The BOT-test (Bratman's Orthorexia Test) consists of ten questions and each "yes" answer is scored with one point. Two to three points indicate somehow disturbed eating behaviour and four or more points indicate a severe problem. If answer to each question is "yes" there is no doubt of an ON. The questions are following:

1. Do you spend more than three hours a day thinking about healthy food? For four hours give yourself two points (The time measurement includes cooking, purchasing foods, reading and discussing about diets)
2. Do you plan tomorrow's food?
3. Do you care more about the virtue of what you eat than the pleasure you receive from eating it?
4. Have you found that as the quality of your diet has increased, the quality of your life has corresponding diminished?
5. Do you keep getting stricter with yourself?
6. Do you sacrifice experiences you once enjoyed to eat the food you believe is right?
7. Do you feel an increased sense of self-esteem when you are eating healthy food? Do you look down on others who don't?
8. Do you feel guilt or self-loathing when you stray from your diet?
9. Does your diet socially isolate you? When you are eating the way you are supposed to, do you feel a peaceful sense of total control?

(Bratman 2000, 47-52; Santala 2007, 31-32)

5.1 Other Related Disorders

In a modern overstimulating society (Karim & Chaudhri 2012, 14) the preoccupation with extremely thin ideal body image unhealthy eating habits have become more common and with them, a risk of developing an eating disorder. According to the National Collaboration Centre for Medical Health (NCCMH) about 1 in 250 females and 1 in 2,000 males experience AN. It is estimated that the prevalence of AN in young females is 0,3 percent and 1 percent for BN. Males make up approximately 10 percent together with AN and BN and 25 percent experience binge eating disorder. AN has the highest mortality rate among adolescent of any psychiatric disorder. Depression is often diagnosed to co-exist with an eating disorder (Kerr et al. 2007, 55.)

5.1.1 Anorexia Nervosa

AN is a disorder where the individual desires to be thin or fears fatness and it is often met with extreme measures. In average the bodyweight of an anorexic is maintained at least 15 percentages below the expected BMI. Anorexics often experience low self-confidence and self-esteem and they see themselves fatter than truly they are. AN often starts with some sort of dieting behaviour that is either kept as ongoing or restricted more. The prior in anorexia is weight control which leads an individual to restrict the allowed foods continuously (Kerr et al. 2007, 56-57; Santala 2007, 30.)

Three fundamentals are required to be met in the diagnosis of AN. First fundamental is self-inflicted weight loss that is caused by avoidance of foods that are considered *fattening*, self-included vomiting, abuse of purgatives, or excessive exercise. It is not uncommon that these weigh loss patterns co-occur. The second fundamental is: “A secondary endocrine disorder of the hypothalamic-pituitary-gonadal axis manifest in the female as amenorrhoea and in the male by a diminution of sexual interest and activity.” (De Coverley Veale 1987) The third fundamental being the morbid fear of fatness or being unable to control the eating regimen (De Coverley Veale 1987, 737-738; Kerr et al. 2007, 56-57.)

As the AN continues and becomes more serious, social WD, rigidity and obsessionality are likely to occur. The anxiety over food and social situations (leisure time, work) grows as the

intensity and duration of anorexia evolve. In the most severe situation AN can affect every system in the body, leading to failure of the organs and later to death. More common symptoms of anorexia in general range are fatigue, lack of energy, disturbance in menstruation, loss of sexual desire. Physical symptoms of weight loss include the loss of muscle strength and later the muscles itself, loss of bone density increasing the risk of osteoporosis, and permanent stunting of growth. In most cases AN requires institutionalizing (De Coverley Veale 1987, 737-738; Kerr et al. 2007, 56-57.)

5.1.2 Bulimia Nervosa

There has been evidence about strong correlation between AN and BN, as over 25 percent of bulimics have suffered at least symptoms of AN. Like in AN, bulimics suffer with a morbid fear of fatness, but it does not occur as in AN; Bulimics suffer from episodes of binge-eating, where the individual consumes a large amount of food, often with no interruptions. After the binge eating episode the weight control follows in such forms as self-starvation, self-induced vomiting, abuse of purgatives, or excessive exercise. An individual suffering from BN is usually able to maintain the body weight within the normal range with the weight control methods, however, some of the bulimics may be overweight (De Coverley Veale 1987, 737-738; Kerr et al. 2007, 57-59; Santala 2007, 30.)

Often bulimics are concerned about their body shape and weight as anorexics and they experience low self-esteem and physical self-loathing. As anorexics bulimics are secretive towards the bulimic behaviour. As the bulimic does not often have any external signs of the disorder in contrast to anorexics the disorder is hard to diagnose, if the bulimic individual is in denial (Kerr et al. 2007, 57-58.)

Much like in AN, bulimics experience symptoms of fatigue and irregular menstruation. More specific symptoms for BN are bloated feeling, constipation and abdominal pain, swelling of the hands and/or feet, and the erosion of the tooth enamel, due to the self-induced vomiting. In severe cases also BN can cause severe damage to the internal organs and the bulimic episodes may occur daily (Kerr et al. 2007, 57-58.)

6 EXERCISE DEPENDENCE AND EATING DISORDERS AMONG ATHLETES

In order an athlete to meet the standards of certain athletic level and gain success from their performances, has the athlete train significantly frequent and intense exercises. Tough training routine of an athlete might strike as a behavioural pattern of an exercise dependent individual, the behaviour does not necessarily constitute an addiction. An athlete must devote a significant amount of time towards the training regimen and might even experience symptoms of WD during the regimen. However, an athlete's routine is executed with cycles; an athlete preparing for a competition devotes merely all of his/her time into the exercises, until the frequency and intensity are reduced. It is even likely to an athlete to experience WD during the most intensive cycle. In contrast, an exercise dependent individual does not reduce the frequency or the intensity of the training (Kerr et al. 2007, 92-93; Richardson 2012a.)

For an athlete, diagnose of ED is a complex matter and is often left undetected or explained by the training regimen. In prior to ED, more attention is distributed for eating disorders since 1990s, when sport psychologists began to realize the problem of eating disorder among athletes. The eating disorders in athletes are often a result of direct or indirect encouragement by the coaches, parents and competition judges. As already is stated, ED is not commonly diagnosed among athletes, but in eating disorders it has a crucial role, as more extreme rigorous training is emerged due to the effects of weight loss in performance (Kerr et al. 2007, 78.)

Studies have been able to demonstrate that athletes are more vulnerable towards eating disorders than non-athletes, the prevalence being slightly higher among athletes. Athletes seem to appear more *perfectionists* and are in higher risk of anorexia and bulimia nervosa, despite the fact that non-athlete individuals with anorexia or bulimia generally score low on self-esteem, as athletes score higher on self-esteem and healthier attitudes towards themselves and nutrition. Athletes can be divided into six classification groups that are classified the common elements of certain sport; technical, aesthetic, weight-dependent, endurance, ball games, and power sports. Aesthetic sports are considered to be sports, where judges rate performances; weight-dependent sports include martial arts and other sports that require weight classification in order to compete in a certain weight division. Endurance sports consist of long distance running, cycling and sports that require speed and efficiency that are

enhanced by low body weight and fat percentage. technical sports include high and long jumping, golf and sailing; ball games are such as basketball and soccer; and power sports are discuss, sprints and javelin throwing among others (Kerr et al. 2007, 78-82.)

Aesthetic, weight-dependent, and endurance sports are considered to be thin-built (i.e. emphasize leanness) sports where low bodyweight provides advantages in performance and within these sports, the risk of anorexia and bulimia is indicated to be higher than in the other classification sports. However, often when using a strict criterion of DSM-III-R (Diagnostic and Statistical Manual of Mental Disorders, third version) for anorexia and bulimia, none or only few athletes could be diagnosed with disorders. In contrast when sub-clinical level of evaluation was used the prevalence of the symptoms of anorexia and bulimia seem to be higher. Among the eating disordered athletes three categories of factors that might trigger the development of an eating disorder could be specified: prolonged periods of dieting or weight fluctuations, traumatic events (e.g. injury, illness or comments about individuals weight), and significant increase in training volume. In these categories, the eating disorder can slowly develop and be unnoticed by the athlete and the trainer (Eriksson et al. 2008, 390; Kerr et al. 2007, 82-91.)

Anorexia athletica is used to classify athletes who do not meet the DSM-III-R criteria of anorexia as a condition for athletes who show symptoms of sub-clinical eating disorder Anorexia athletica is not clinically recognized in the disorder guidelines or as a sub-clinical condition but is used often in sports psychology literature towards the eating disorder condition among athletes.. Anorexia athletica consist the of the same similar symptoms to anorexia and bulimia; fear of gaining weight, reduction in food intake, vomiting, using laxatives and/or diuretics in addition to lose or control the weight. The self-inflicted weight loss is a feature of primary ED. The weight loss is used by means of improving performance (De Coverley Veale 1987, 738; Kerr et al. 2007, 63-64.)

To meet the criteria of anorexia athletica, a female athlete must be 5 percent or more underweight than normal weight is considered among the females of the same age and height in general population. In diagnosing the condition, relative criteria are used to specify the condition; delayed puberty, menstrual dysfunction, disturbed body image, use of purging, binge eating and compulsory exercise (Kerr et al. 2007, 63-64.)

7 RESEARCH TASKS

The purpose of the thesis is to describe exercise dependence and orthorexia as a phenomenon, the possible correlation the addiction and the disorder, the self-image of an exercise dependent and the reasons behind the dependence and a possible disorder. The aim of the thesis is to provide knowledge concerning the wellbeing of students (athletes and non-athletes) in Kainuu region. The research tasks are:

- What are the reasons leading to exercise dependence?
- Are there symptoms of orthorexia co-occurring?
- Is the exercise dependence primary or secondary and how does it occur?
- Does the nature of exercise dependence differ between non-athletes and athletes?

8 RESEARCH METHOD

The thesis is based on theoretical knowledge and qualitative research method and data analysis. The theoretical knowledge is applied to data collection and the qualitative analyzing method. The topic was chosen as it is current, but mostly for a reason that I find the topic personally extremely interesting. The thesis supports my specialization studies in a field of coaching. Not only can the topic be connected to professional sports, but also for non-athlete individuals. In this thesis, the discussion and research about the *dark side* of exercise is aimed to emphasize physical activity as a positive, health enhancing prospect rather than a way to meet the *expectations* of lean physique and attractiveness created by mass media.

The commissioning party of the thesis is Myötätuuli, the School of Health and Sports Learning clinic. Myötätuuli is a learning environment in which students use the knowledge and skills acquired during their studies and practical training in order to produce, plan, implement and assess health services for people of all ages. The clinic's services focus on health promotion and coping support. It also offers services in the field of sports and leisure management. Myötätuuli has a partnership with Kajaani University of Applied Sciences (KUAS).

Myötätuuli enhances knowledge in the field of sports and leisure. This thesis provides valuable information about the *dark side* of physical activity. The thesis helps instructors to recognize features of exercise dependence and orthorexia among exercisers. The information provided can be used for the welfare of the students in Kainuu region, as the information can be forwarded to the student health care centre VITAL.

8.1 Sample Group

The participants are chosen by using the short form EAI screening tool and EDQ, as EAI screening tool is a 5 item questionnaire, EDQ is used in comparison of the results. Participants are requested to fill in the EAI and EDQ questionnaires and as the overall scores are calculated, the participants providing the research (i.e. interview) data can be chosen. Participants scoring 13-23 points in short form EAI indicate somehow of an symptomatic indi-

vidual (Terry et al. 2003, 493), as in EDQ a total score of more than 116 is an indication of exercise dependence (Bamber, Cockerill & Carroll 2000).

The participants are requested to fill in the BOT and the eating attitudes test (EAT-26) only for a comparison towards other possible eating disorders. EAT-26 is not designed to provide a diagnosis and is only screening tool for possible presence of symptoms towards an eating disorder (EAT-26). The BOT test has not a cut-off score (nor does the EAT-26), as it secondary, and is used only to research the relation between ED and ON. The sample group consists of non-athletes and athletes. The tests were chosen as they could be analysed by hand.

8.2 Data Collection

The interview data is collected by semi-structured interviews that will be tape recorded. Immediately after each interview the audio tape will be gone through and transcribed and journal entries are made of any initial thoughts provoked by the interview (Bamber, Cockerill, Rogers & Carroll 2000, 424-425.) The questions one to three are taken from a study made by Bamber et al. 2000 (424-425).

1. How would you describe your physical activity levels as a child?
2. How would you define exercise dependence?
3. How do you feel if you are unable to exercise?
4. Did you/do you recognize any signs towards exercise dependence?
5. How was/is your self-image and motivations towards exercising?
6. How is/was your training regimen?
7. Has anyone commented about your training?
8. What did/does physical activity mean to you?

9. How does/did your training affect to your nutrition?

8.3 Analysis of the Data

The data will be analyzed with qualitative content analysis. Within the qualitative analysis there are two approaches to analyze the data: inductive and deductive. In the thesis the inductive method of analyzing is used. The inductive method is used when there is not enough former knowledge of phenomenon and it is *in data* centred, in contrast to deductive method that is based on previous knowledge and the purpose of the study is theory-testing. As the interviews are transcribed into text form, analyzed and journal entries made, the data is later reread, checked, and edited with the help of audio tapes. After the interview data is reread and checked, the data is analyzed by with the inductive analyzing method. First the data is open coded, so notes and headings are made into the text. Open coding can be done while the rereading phase. After the open coding, list of categories are made under the headings in order to group similar or related observations. The idea of categorizing is to increase the understanding of the phenomena by providing means of describing. (Babmer et al. 2000, 425; Elo & Kyngäs 2007, 107-111; Kyngäs & Vanhanen 1999, 3-5, 7.)

9 RESULTS

There were three participants in this thesis. The sample group consisted of one athlete and two non-athletes within or out in sports industry. Some of the sample group had already passed the time in their lives where they felt or recognized later symptoms of ED. All of the participants described being very active in their childhood and exercising was and would be important in their lives. A scoring range between the four tests was as such:

Table 1. Scoring range

	Lowest	Highest	A risk of an addiction or an disorder (scoring)	Maximun scoring
EAI	26	30	13-23	30
EDQ	131	155	116	203
EAT-26	13	58	20	78*
BOT	8	10	4	11

* Behavioral questions were left out in this study. The maximum scoring is based on scoring of the statements

The tests indicate that exercise was estimated to be very important or most important thing in the participants' lives. All of them had had conflicts resulted by exercise, had increased the amount of exercise over time and experienced symptoms of WD if they are/were not able to exercise.

The tests indicate that exercise is/was used as a way of changing ones mood, or avoiding WD symptoms. A rest of ones life should fit around exercise. EDQ indicates that the main reasons for exercising were to improve ones physique, lose weight and to look and feel more attractive. The energy used to exercise decreased energy to maintain relationships between family and friends.

“The time I randomly quit exercising in high school I didn’t worry about my eating ever and probably had the healthiest relationship with food I have ever had. I didn’t stress about it because I didn’t even realise exercise was something I should be doing.”

EAI and BOT indicated that being overweight terrified the participants and thinking about food did preoccupy each of them daily. All of them were aware of the calorie content of the foods they ate and a thought of being thinner preoccupied them daily and everyone thought about burning calories during exercise, and some of the participants felt that food isolated them from others.

The participants were asked to define ED in their own words. The answers are listed below:

“It is a bittersweet thing; when you work extremely hard you feel extremely good, but it takes away everything else in life. Values in life become distorted and you become blind to the matters that really are important.”

“One exercises crazy amounts weekly, does not remember to rest and does not listen to ones body even if it would crave for rest. Ones mentality won’t hold if one cannot exercise.

“Exercise dependence to me is when one can’t cope without doing their daily exercise. Until you do it the pressure just grows and it’s the only thing you can think of.

Each of the participants admitted feeling the same emotions they listed when they were asked to define ED. None of them recognized any signs of ED at first as they began to focus on being healthier: exercising more and eating healthy. The feeling of not being able to exercise was classified to be stressful, a person would become frustrated and extremely emotional, even depressed;

“If I was unable to exercise I felt awful. I felt like I had failed as a human being in every way. I was angry and vented my frustration to other people. Many times I just wanted to be alone, and became more alienated from other people. I think this way my self-image became more distorted and I could not recognize myself anymore. I felt like I had lost myself.

All of the participants did recognize signs towards ED afterwards, whether the realization would come from a realization of different motives or comments from friends or family. The participants described feelings of numbness and tiredness, but the feelings were ignored because of the necessity to exercise and develop, until the symptoms reached a point when ones body had ran out of energy. Some of the participants admitted exercising when injured. The comments received from friends and family at first seemed to be more of wondering how much time does exercising take from the person. Most of the participants said that they did not receive comments as they would often exercise alone and most of times the times of the training were kept as a persons’ own information.

“At some point I understood that my motives towards exercising were not the same that they used to be. As a child I enjoyed exercising because it was fun and I got to be with my friends. Exercise turned into addiction, because I started exercising for a better physical appearance. I wanted to look muscular and fit. I even wanted my body to be extremely fat free.”

“I will train even if injured: I had mycoplasma and my legs have been so sore that I could not walk. With a cold- and hot gels I could box. None of the previous things could stop me from exercising or competing.”

A self-image of the participants was fluctuate and affected by the fact of how much were each of them able to exercise. Most of the participants felt pressure from the mass media, and compared themselves to figures they saw in the publicity, such as models or fitness athletes.

“During the time of exercise addiction my self-image was shattered and I hated myself for my physical appearance. I spent a lot of time in front of the mirror evaluating myself.”

The training regimen of the participants would contain any possible form of exercise and all of them estimated their training to be average of 15 hours a week. The intensity would not vary between trainings, even due to an illness.

Exercise itself meant everything for the participants, and all of them stated physical activity to be a big part of their lives in the future, but they have learned the importance of listening their own bodies.

Exercising affected directly to the nutrition, as most of the participants were aiming towards a healthier lifestyle. One of the participants had a readymade diet plan that could be altered, but with the conditions of the coach, and one of the participants was a vegetarian, who concentrated on fruits, vegetables and eggs in the diet. Most of the participants said that they would think of how many calories the exercise would burn, and that way would allowed themselves to eat more. For one of the participants, this thinking pattern became almost the only acceptable way to allow the person to eat.

“I had to eat more at the time that I wanted because otherwise I would not have energy to exercise. Still I ate less than my basic metabolic rate would have required. The focus in my diet was to increase the amount of protein, even if at the same time I tried to cut down the amounts of foods I ate as much as I could. I ate consciously ate less than I consumed. I counted the calories and measured the amounts of different foods very carefully.”

“I started to take notice of what I eat, when I eat and how I eat. Nowadays most of the foods go through a scale. I rarely eat anything that would differ from my daily regimen. I do not necessarily feel bad if occasionally I would eat a slab of chocolate.”

“In the beginning my training and nutrition were in direct correlation with each other, and the more I would exercise the more would allow myself to eat. After a while though, like my exercise my eating was a regimen that followed the same pattern every single day. All my meals were the same whether I did yoga or killed myself at the gym for hours, which lead to malnutrition.”

10 DISCUSSION

A straight correlation between EAI, EDQ, EAT-26 and BOT tests do appear, as individuals reasons and motives towards exercising and the relationship with food can be specified. Aspects that can be taken straight from the tests and questionnaires emerged in the interviews. The tests do not offer a diagnosis, but create a foundation for understanding a possible dependence or a disorder. The theoretical part of the thesis supports the results of the qualitative study (Allegre et al. 2006, 636-642; De Coverley Veale. n.d., 737-738; Kerr et al. 2007, 99-100, 103, 105-106.)

A difference could be seen between the athlete and non-athletes. In the theory part of the thesis ED in athletes is presented and much of the researches are made with weight dependent sports. A participant of this thesis is participating a weight dependent sport and that can be seen from the interview. Eating right is an important matter and a dietary plan is pedantic. Most of the participants food goes through a scale before it can be served on a plate, but the participant did have the healthiest relationship with food. The fact that the relationship with food is not distorted is mostly due to the fact that the participant does not exercise for a better physique, but to develop in the participants own sport and to reach the set goals (De Coverley Veale. n.d., 735-738; Kerr et al. 2007, 77-94.)

ED seemed to emerge as primary for the participant who actively was engaging sport and can this way be called an athlete. The participant was very goal orientated about exercise and development. The participant had the healthiest relationship with food and did not restrain from food, other than with a dietary plan made with the participants coach. The participant engages a weight dependent sport, a strict dietary plan can be understood (De Coverley Veale. n.d., 735-738; Kerr et al. 2007, 77-94.)

For the other two participants ED seemed to be secondary as exercise was a way to modify ones physical appearance, despite the fact that secondary ED can only be diagnosed if an eating disorder is diagnosed first. Limiting foods and different nutrients played a big role in the weight loss project. With neither of the participants an eating disorder was diagnosed, but signs pointing towards secondary ED are the secondary nature of exercise compared to the weight loss and modifying ones body shape (Allegre et al. 2006, 636-642; De Coverley Veale. n.d., 737-738; Kerr et al. 2007, 99-100, 103, 105-106; Weik & Hale 2009, 206.)

Throughout the interviews standards of beauty seemed to be the reason why for the most of the participants the motives towards exercising changed. The society and mass media offers an image of an ideal body, and at a current state a more athletic and healthier physique is appreciated. For the participants, the body is considered as a project (Bratman 2000, 9-10; Eriksson et al. 2008, 389-390; Santala 2007, 21-22.)

In a current society *high quality* foods such as raw foods are easily accessible and have become trends as has the fitness industry. There are diets and exercise plans available for anyone to use in internet but what is not considered is that these plans do not take a persons' physical activity level, basic metabolic rates or likings into consideration and cannot be for everyone to use (Bratman 2000, 9-10; Eriksson et al. 2008, 389-390; Santala 2007, 21-22.)

A straight correlation between exercise and nutrition does exist, as a person pursuing a healthier lifestyle does modify their dietary plan. ON seems to be more common than it has been thought as it is hard to diagnose and has many similarities to AN, which is why it has not been recognised as a true disorder (Bratman 2000, 2)

10.1 Reliability and Ethicality

There are three participants interviewed in this thesis. As the topic of the thesis is highly sensitive it may affect the participation of the thesis, as individuals do not want to come forward with their past or current situation in their lives. Some of the sample group had already passed a situation in their lives where they felt or later recognized symptoms of ED, so it is possible that some things are left out, or are different in the interviews as they can be forgotten, or the memories can have changed.

The reliability of the thesis is increased by the criticality towards the sources. There are several studies made concerning exercise dependence and reliable sources can be found. The semi-structural interviews and well organized inductive analysing method increase the reliability. In order to have reliable data from the interviews a kind of participants were needed that are or have experienced exercise dependence. The selection of the participants was made using the valid EAI questionnaire which is the only theory-based screening tool for exercise dependence so far. The EDQ was added to the selection of the participants as it could be evaluated by hand. The EAT-21 and BOT tests were added in order to research the

possible relation between ED and ON. The reliability is increased by the clear correlation between the theory and the qualitative study conducted.

Ethicality of the thesis is managed by the permission from the headmasters of the schools in Kainuu region for a permission to study the students of the universities as well from all of the participants. The interviews are recorded into a device in which the access rights belong only to the researcher. As the interviews are transcribed, reread, checked, and analyzed the interviews are deleted. The researcher is tied to professional secrecy.

The reliability of the thesis is decreased by the factor that there is one researcher, therefore the data analysis is narrower and more concentrated to the researcher's own thoughts, pre-understanding of the topic, the idea of man and the low number of participants predicted to be interviewed. The ongoing debate whether or not exercise dependence actually exists or is just a symptom of another disorder and the low number of researches done about orthorexia. As neither of the disorders is clinically proved and diagnosed, there is always a question whether or not they do exist. Also the EAI method is ongoing and is only a brief screening tool for recognizing exercise dependence. The BOT test has not been recognized as a valid measurement for ON, but it is the only screening tool available. Due to these facts the researcher, however, feels that a comprehensive amount of information is gained throughout the research, and if the affections of the participants are compatible, reliability is increased.

The results and conclusions of this thesis cannot be generalized, as they were only three participants in the thesis. This does not give fully reliable results, and as the results are interpreted by only one researcher the outcome is affected by the researcher's pre-understanding of the topic and the idea of man.

10.2 Professional Development

The author's professional development increased throughout the thesis project as the project demanded constant criticality and focus towards the ethicality and reliability of the thesis. The author engaged with the topic of the thesis and has a somewhat level of expertise on the current topic. The author indicated her professional skills in the thesis and was able to develop further as the thesis process proceeded. The professional development did not in-

crease in a matters concerning to working life, as this thesis could have been more connected to the working life.

10.3 Further Studies

From the researchers point of view, the topic of thesis is current and needs to be researched more closely, as neither exercise dependence nor orthorexia are well indentified in Finland. In Finland a few studies from orthorexia are made, however, it is more bypassed with the side of other disorders such as anorexia and bulimia nervosa. The topic is essential for the wellbeing of future professionals of a fitness industry, as a universal belief of a professional in fitness industry consist of an image of the *ideal body* and remarkably healthy eating and lifestyle habits. The correlation between exercise dependence and any eating disorder requires attention as this study provides only a glimpse of information about exercise dependence, orthorexia and other eating disorders.

Further studies should be made in order to provide more knowledge to professionals in a medical and fitness industry to be used in their profession. As exercise dependence and orthorexia are behavioural addictions and disorders a difficulty of creating a foundation for a recovery process does exist but would be an important aspect to be researched. When the recovery process from exercise dependence and orthorexia is researched a plan of withdrawal could be researched, as neither the recovery process nor the withdrawal is not researched yet. Further studies about orthorexia should be made by separating orthorexia and anorexia nervosa.

11 CONCLUSION

Based on the qualitative study method implemented in this thesis the author has made four conclusions based on the results of this study:

1. The measurements used in this study create an accurate foundation of understanding about the motives of a person towards exercising and eating
2. A difference between exercise dependence among athletes and non-athletes does exist as athletes seem to be more goal orientated and non-athletes concentrate more on physical appearance.
3. With the difference between the motives and reasons towards exercising and eating a division between primary and secondary exercise dependence can be made.
4. Mass media and social surroundings have a straight influence in classifying the standards of beauty; *ideal* body image and *healthy* eating habits.

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LIST OF APPENDICES

Appendix 1: Research permission from the principal

Appendix 2: Research permission from the student

DEAR PARTICIPANT

My thesis is about exercise dependence (i.e. excessive exercise, exercise addiction) and related disorders among students in the region of Kainuu.

The purpose of the thesis is to research the appearance of exercises dependence and what are the reasons behind the addiction, and are there any disorders related to it. The aim of the thesis is to provide more knowledge about exercise dependence and related disorders in order to clarify the reasons behind these disorders.

The data will be collected in semi-structured interviews that are recorded for the later use of analyzing the results in the thesis. The interviews are conducted only with the presence of the researcher and the participant and only I have access to the recordings.

All material and information related to this thesis is confidential. The names will not be turned out from this thesis. The researcher is tied on professional secrecy. The data will be analyzed by using the inductive approach of a qualitative study.

It is voluntary to take part of this research. I ask you to give a written consent to me. You have the right to ask more information about my research. I would be pleased to answer your questions.

Kind regards

Taru Ketola, SPO10S

spo10staruk@kamk.fi

APPROVE FORM TO TAKE PART TO THE RESEARCH

I have got enough information about the research. I know that my participation is voluntary and I can call of my participation any time.

I understand that my answers are managed in confidence and only by the researcher..

Place and date _____

Signature _____

Clarification of the name _____

DEAR PRINCIPAL

My thesis is about exercise dependence (i.e. excessive exercise, exercise addiction) and related disorders among students in the region of Kainuu.

The purpose of the thesis is to research the appearance of exercises dependence and what are the reasons behind the addiction, and are there any disorders related to it. The aim of the thesis is to provide more knowledge about exercise dependence and related disorders in order to clarify the reasons behind these disorders.

The data will be collected in semi-structured interviews that are recorded for the later use of analyzing the results in the thesis. The interviews are conducted only with the presence of the researcher and the participant and only I have access to the recordings. The recordings are deleted after the analysis process, and the analysis data is destroyed after the final thesis is submitted.

All material and information related to this thesis is confidential. The names will not be turned out from this thesis. The researcher is tied on professional secrecy. The data will be analyzed by using the inductive approach of a qualitative study.

It is voluntary for a student to take part of this research. I ask you to give a written consent to me. You have the right to ask more information about my research. I would be pleased to answer your questions.

Kind regards

Taru Ketola, SPO10S

spo10staruk@kamk.fi

APPROVE FORM FOR THE STUDY TO BE CONDUCTED IN THE SCHOOL

I have got enough information about the research. I know that the student participation is voluntary and the student can call of his/her participation any time.

I understand that the students' answers are managed in confidence and only by the researcher.

Place and date _____

Signature _____

Clarification of the name _____