

**EXPLANATIONS, MOTIVES AND PSYCHOLOGICAL
FLEXIBILITY ASSOCIATED WITH WEIGHT CONTROL
AMONG FINNISH OBESE PERSONS**

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Over-weight people are often able to lose weight with help of professionals but almost always they fail to maintain behavior changes, which lead to favourable results. The aim of this study was to find out how overweight weight controllers perceive factors affecting their weight and what motivates them for weight control and lifestyle changes during the follow-up of weight loss program. It was examined how weight changes during and after weight-loss program was related to those perceptions and motives of obese weight controllers. Also, it was examined how psychological flexibility is related to understanding of factors affecting weight and motivating weight control. 49 obese persons participated in the follow-up 8 months after the end of weight-loss program.

Factors affecting weight were asked using an open question (weight analysis questionnaire) and factors motivating for weight control and lifestyle changes were asked by ready made classes of different areas of life (value categories). In addition to eating habits and exercise, social factors were frequently named as factors affecting weight. Important motivating factors for weight control and lifestyle changes were health, intimate relationships, leisure activities, work and other social relationships. Success in weight loss and maintenance was related to differences in factors affecting weight and motivating weight control. Also, psychological flexibility was related in different kind of perceptions and motivators related weight control among obese weight controllers. The role of social factors in weight control was diverse. Our results suggest that social factors motivate more persons who have lower psychological flexibility. Moreover, participants who saw intimate partnerships as a reason for weight control or lifestyle changes had lost less weight during weight loss program. More psychologically flexible weight controllers were also more willing to change their life situation, life rhythm and health, and evaluated self-control affecting more their weight. As a clinical application, this may mean that working with psychological flexibility (including values) may affect obese people's perceptions of factors affecting their weight and motivation to make lifestyle changes.

Keywords: obesity, weight losing, weight control, weight loss maintenance, motives, values, explanations, psychological flexibility

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Painonpudotukseen johtavien pysyvien käyttäytymismuutosten tekeminen on osoittautunut hyvin vaikeaksi, minkä vuoksi paino useimmiten nousee painonpudotuksen jälkeen. Tämän ilmiön paremmaksi ymmärtämiseksi tutkimuksemme tarkoituksena oli selvittää ylipainoisten painonhallitsijoiden käsityksiä painoonsa vaikuttavista tekijöistä sekä painonhallintaan ja elämäntapamuutoksiin motivoivia tekijöitä painonpudotuksen jälkeisessä seurannassa. Lisäksi tutkittiin painonpudotusohjelman aikaisten ja sen jälkeisten painomuutosten sekä psykologisen joustavuuden yhteyksiä näihin painonhallitsijoiden käsityksiin ja motiiveihin. 49 ylipainoista painonpudotusohjelmassa mukana ollutta henkilöä osallistui noin 8 kuukautta ohjelman päättymisen jälkeen pidettyyn seurantaan.

Painoon vaikuttavia tekijöitä kysyttiin avoimella lomakkeella, jossa kysyttiin lisäksi osallistujien halukkuutta tehdä muutosta kuhunkin mainitsemaansa tekijään. Motiiveja painonhallintaan ja elämäntapamuutoksiin kysyttiin elämänalueittain. Painoon vaikuttavina tekijöinä ylipainoiset painonhallitsijat ilmoittivat liikunnan ja syömistottumusten lisäksi yleisesti sosiaalisia tekijöitä, kuten perheen tai ystävät. Tärkeitä motiiveja painonhallintaan ja elämäntapamuutoksiin oli terveys, parisuhde, vapaa-ajan harrastukset, työ sekä muut sosiaaliset suhteet. Painonpudotuksessa ja -hallinnassa eritavoin onnistuneet erosivat painoon vaikuttavien tekijöiden maininnan sekä painonhallinnan motiivien suhteen. Myös psykologinen joustavuus oli yhteydessä painonhallitsijoiden erilaisiin näkemyksiin ja motiiveihin. Sosiaalisten tekijöiden vaikutus painoon oli moninainen. Tulokset ehdottavat, että sosiaaliset tekijät motivoivat enemmän henkilöitä, joilla on alhaisempi psykologinen joustavuus. Lisäksi henkilöt, joita parisuhde motivoi painonhallintaan, pudottivat vähemmän painoa painonpudotusohjelman aikana. Psykologinen joustavuus oli yhteydessä myös halukkuuteen tehdä muutoksia elämäntilanteeseen ja terveyteen, sekä itsekontrollin korostamiseen painoon vaikuttavana tekijänä. Siten tutkimuksen tulokset ehdottavat, että psykologisen joustavuuden lisäämisellä voisi olla vaikutusta ylipainoisten käsityksiin painoon vaikuttavista tekijöistä sekä ylipainoisten motivaatioon tehdä elämäntapamuutoksia.

Avainsanat: lihavuus, ylipaino, painonpudotus, painonhallinta, motiivit, arvot, selitykset, psykologinen joustavuus

INTRODUCTION

Regaining weight after weight-loss is very common. Over-weight people are often able to lose weight with help of professionals but almost always they fail to maintain behavior changes, which lead to favourable results (Cooper et al., 2010; Jeffery et al., 2000). Weight control research over the last 20 years has dramatically improved short-term treatment efficacy but has been less successful in improving long-term success. An approximate doubling of average weight losses over two decades since 1974 to 1994 has been accompanied by an approximate doubling of treatment durations (Perri & Fuller, 1995; Jeffery et al., 2000). The natural history of weight loss and regain among patients participating in behavioral treatments in obesity is remarkably consistent (Jeffery et al., 2000). The rate of initial weight losses is rapid and then slowly declines. The point of maximum weight loss is usually reached approximately 6 months after the initiation of treatment. Weight regain then begins and continues gradually until weight stabilizes somewhat below baseline levels.

Intensifying initial treatments for obesity by encouraging more severe restriction in energy intake or extending the length of treatment can produce larger weight losses. Increasing initial weight losses by these methods, however, has had little effect on long-term maintenance of weight loss (Jeffery et al., 2000). It has been found that, only 20 % of the patients with dietary treatment are able to maintain a weight loss of 10 kg or more during more than three-year follow-up. In combination with behavioral treatment, the percentage of successful weight maintainers increased to 27%. Thus 70 to 80% of the patients regained their lost weight (Ayyad & Andersen, 1994; Westenhoefer, 2001; Cooper et al., 2010).

The latest entry in obesity treatment comes from the group at Oxford led by Christopher Fairburn and Zafra Cooper (Cooper et al. 2010), among the world's leading eating disorders researchers. Based on years of research developing successful treatments for bulimia nervosa and binge eating disorders, Coopers, Fairburn and colleagues derived a treatment focused on the maintenance of weight loss. Ultimately they, like others who preceded them, were humbled by obesity, concluding that, "...it is a remarkably difficult to maintain a new lower weight following weight loss." This relapse appears to be attributable to the individual's inability to persist with the behavioural strategies needed to maintain the new lower weight. Relatively few studies have investigated the psychological mechanisms that might account for this phenomenon. In order to improve the long-term outcome of treatments for obesity, it is important to understand why most people who lose weight regain it. Much can be explained by strong

biological and environmental forces that oppose weight loss and foster regain (see Brownell, 2010). However, it is not clear how or why a small proportion of individuals are able to persist with these behaviours when most people do not.

One theoretical framework, the Transtheoretical Model of Health Behavior Change (TTM), has been successful in changing behaviors associated with obesity (Riebe et al., 2005). The central organizing construct of the TTM is stage of change, which defines the temporal dimensions of the model (when people change) as well as where people are in the change process. Using this model, individuals can be classified into one of five stages of change for exercise and for diet: (1) precontemplation—no intention of changing to the goal behavior in the foreseeable future (operationally defined as the next 6 months), (2) contemplation—intends to reach the goal behavior in the foreseeable (within the next 6 months) future, (3) preparation—intends to reach the goal behavior in the immediate future (within the next 30 days) and generally has taken behavioral steps toward the goal, (4) action—has recently achieved the goal behavior (less than 6 months), and (5) maintenance—has achieved and continued the goal for at least 6 months. The TTM postulates that stage progression is mediated by use of decisional balance, processes of change, and self-efficacy/temptations. Decisional balance involves the individuals perceptions of the pros and cons of changing behavior; temptations or situational self-efficacy involves the individuals confidence in engaging in a healthy behavior during adverse conditions (or perceived temptations to engage in an unhealthy behavior), and the processes of change are the specific experiential and behavioral strategies that promote change in motivation and/or behavior to help the person advance through the stages of change.

The study of Riebe et al. (2005) found that TTM variables are associated with longterm maintenance of dietary and exercise behavior change in overweight and obese adults. For exercise, several constructs of the TTM emerged as being important to distinguish between maintainers and the other groups. Individuals who never met the exercise criterion reported more cons for exercise. This finding is typical for the early stages of the TTM and suggests that these individuals never moved past being in precontemplation or contemplation for exercise. Most of the research examining the relationship between exercise and weight-loss maintenance suggests that regular exercise enhances weight-loss maintenance over time (Dohm, Beattie, Aibel &, Striegel-Moore, 2001; Jeffery et al., 2000). Putting greater emphasis on exercise as a component of obesity treatment appears to enhance weight loss at all time points and may possibly help slow weight regain after initial treatment (Jeffery et al., 2000).

Successful weight loss maintenance is also related to higher levels of self-efficacy (Jeffery et al., 2000, Byrne, 2002; Linde et al., 2006) or confidence (Riebe et al., 2005). For those who failed to change, confidence was low and remained low throughout the entire study. Maintainers had significantly higher confidence, and it remained high throughout the entire study. Relapsers were confident in their ability to exercise at the end of the clinical program (which lasted 6 months) but dropped off throughout the remaining 18 months (Riebe et al., 2005). Self-efficacy is defined as an individual's belief in his or her ability to perform and succeed in challenging situations (Bandura, 1977; Linde et al., 2006). Self-efficacy for both eating behaviors (confidence in following eating plan under varying conditions) and exercise behaviors (confidence in following exercise plan under varying conditions) were associated with specific diet and exercise behaviors in the context of a cognitive-behavioral weight loss intervention (Linde et al., 2006). In this study of Linde et al., initial self-efficacy beliefs predicted weight loss outcomes during active treatment but not during the posttreatment period. Moreover, people's weight loss behaviors mediated the impact of self-efficacy on weight. So, self-efficacy beliefs may elicit a set of weight control behaviors, but their impact on weight depends on the effectiveness of those behaviors.

Studies have reported an association between experiencing stressful life events and weight regain (Byrne, 2002). However, other studies have shown that it is not the absence of stress, but rather the ability to cope with stress, that appears to be associated with successful weight maintenance (Byrne, 2002). For example, Kayman and colleagues (1990) reported that in response to stress, unsuccessful weight-loss maintainers were more likely to eat more, sleep more, or wish whatever was causing the stress would go away; in contrast, successful weight-loss maintainers confronted the source of the stress directly (Kayman et al., 1990; Byrne, 2002).

How persons cope with overeating or a lapse in their diet may also influence their ability to maintain a weight loss (Drapkin, Wing &, Shiffman, 1995; Dohm et al., 2001). Drapkin et al. found that the ability to generate coping responses to a number of hypothetical high risk scenarios predicted future outcome among obese persons who had participated in a year-long BT programme. Before starting treatment, subjects were asked to listen to four scenarios describing high-risk situations, such as a family mealtime celebration, an argument, watching television or a stressful situation at work. The results showed that subjects who generated coping responses to more of the situations showed better maintenance of a new lower weight at 12-month posttreatment. The ability to generate any coping response, rather than the number or type of coping responses generated, appeared to be an important

factor. Also, seeking help from others may be an ineffective way of coping with a dietary lapse, and it suggests a possible dearth of self-sufficiency or self-efficacy (Dohm et.al, 2000). As compared with regainers, maintainers are more likely to use direct coping, like increase exercise or watching food intake more carefully and less likely to seek help. Increases in frequency of self-weighing may also help in weight gain prevention, especially for those who has been taught strategies for modifying their behaviors in response to the weight changes (Wing et al, 2008).

Social situations can have an impact on compliance to dietary advice. Most patients with coronary heart disease report difficulties to follow nutritional advice when eating in social situations (Koikkalainen, 2001). Many patients reported that emotions and feelings are involved in difficulties to eat healthily. Food tastes better and smells good when eating in company of other people. Eating at home was most frequently reported as social situation, but eating at home in company was not regarded as difficult to eat healthily, while parties and journeys and restaurants caused difficult eating situations for many patients. Interestingly, overweight patients reported more often cognition's and expectations as reasons for their difficulties to eat healthily in social situations than normal weight cardiac patients (Koikkalainen et al. 1999; Koikkalainen, 2001)

Lack of knowledge can be seen as an obstacle in changing food habits (Koikkalainen et al. 1999; Koikkalainen, 2001; Carels, Harper &, Conrad, 2005). Research shows that people underestimate energy intake and that this underestimation may be greater among the more obese people. Higher baseline BMI was associated with lower accuracy in estimating 'calories' in a behavioral weight loss program (Carels, Harper &, Conrad, 2005). Participants tended to underestimate the amount of 'calories' of healthy foods and overestimate the amount of 'calories' of unhealthy foods. This bias may reflect simple heuristics about foods as either 'good' (healthy and leading to weight loss) or 'bad' (unhealthy and leading to weight gain) (Oakes & Slotterback, 2001; Carels, Harper &, Conrad, 2005). It is plausible that the severity of obesity among the general public may, in part, be related to errors in energy estimation.

Tinker and Tucker (1997) studied motivations for and behavioral strategies used during weight loss of untreated adults with lengthy weight problem histories who had maintained stable weight loss for a mean of 4.5 years. Natural recovery was associated with weight loss methods such as healthier food choices, reduced snacking, eating more slowly, and regular exercise. Exercise appeared to be especially critical for weight loss maintenance. Other positive influences on weight loss and maintenance involved relationships with family, friends, and intimate partners, which is consistent with

the demonstrated role of social support in obesity treatment outcomes (Rigsby, Gropper &, Gropper, 2009; Jeffery et al., 2000). On the other hand, relationships difficulties can be perceived as hurting weight loss maintenance (Tinker &, Tucker, 1997).

Obviously, there is no single most successful strategy for weight reduction and maintenance. The simultaneous availability of a number of different strategies enhances the probability of success (Westenhoefer, 2001). The more strategies are adopted the higher the likelihood of success will be. This indicates that isolated changes of single behaviors will not suffice for long-term success, but that more complex changes of many behaviors and perhaps life-style as a whole are necessary for long-term weight maintenance. Natural recovery was found to involve behavior changes similar to those emphasized in behavioral treatments (Tinker &, Tucker, 1997). This suggest that obesity treatment failures may reflect motivational and contextual impediments to weight loss that may be more common among treatment-seeking samples rather than limitations of the behavior change strategies per se.

In Tinker and Tuckers (1997) study almost all motivational factors associated with weight loss were negative and reflected a combination of immediate and longer-term influences. Specific motivational factors included appearance concerns, negative emotions, and a range of other weight-related problems and negative events involving psychosocial functioning. Although current health problems were not widely cited, concerns about future health were cited with greater frequency, especially among individuals with a family history of obesity-related health problems. Also, health-related motivations were cited more often by men than by women.

Autonomous motivation (regulation of behavior is experienced as chosen) to participate in a weight-loss program is positively related to staying in the program, losing weight during the program and maintaining lowered weight (Williams et al., 1996). Furthermore, the degree to which patients experienced the staff as autonomy supportive was also a significant positive predictor of autonomous reasons for persisting in the program (Williams et al., 1996). This provides clear support for the application of self-determination theory, which differentiates between autonomous and controlled forms of motivation, to the problem of weight loss and its maintenance. According to self-determination theory (Deci & Ryan, 1985; Williams et al., 1996), *autonomous* behaviors are ones for which the regulation is experienced as chosen and as emanating from one's self. In contrast, *controlled* behaviors are ones for which the regulation is experienced as pressured or coerced by some interpersonal or intrapsychic force. Concerning weight loss, self-determination theory (Deci & Ryan, 1985; Williams et al., 1996) suggests that the lasting behavior change necessary for maintenance

depends not on complying with demands for change but rather on accepting the regulation for change as one's own. In other words, it requires internalizing values and regulation of relevant behaviors and then integrating them with one's sense of self so they can become the basis for autonomous regulation.

Autonomous motivated exercise seems to be especially critical for weight loss maintenance (Tinker & Tucker, 1997; Wadden et al., 1998; Wing et al., 2008). Results of Teixeira et al. highlight the importance of cognitive processes during weight control and support the notion that initial focus on diet is associated with short-term weight loss, while change in exercise-related motivational factors, with a special emphasis on intrinsic sources of motivation (e.g., interest and enjoyment in exercise), play a more important role in longer term weight management (Teixeira et al., 2006). Whereas extrinsic types of motivation are contingent on reaching a goal separated from the behavior (e.g., getting a reward, compliance with others' expectations, not feeling guilty), intrinsically motivated behaviors originate in the person (i.e., they have an internal locus of causality), are internally regulated, and are inherently enjoyable and interesting (Ryan & Deci, 2000; Teixeira et al., 2006). While gains in cognitive eating restraint and exercise self-efficacy and a reduction in perceived barriers were good correlates of short-term weight loss, an increase in intrinsic motivation (e.g., interest and enjoyment in exercise) for physical activities was the strongest predictor of longer-term results (Teixeira et al., 2006). Instead, supervised exercise training is unlikely to facilitate the maintenance of weight loss if participants aren't motivated to continue exercising (Wadden et al., 1998). The combination of diet plus exercise failed to produce significantly greater short- or long-term weight losses than treatment by diet alone in a 48-week program of diet and behavior modification. However, participants' reports that they exercised regularly during follow-up correlated positively with the maintenance of weight loss (Wadden et al., 1998). Persons who reported exercising regularly in the 4 months, before the 1-year-followup, regained significantly less weight and maintained a significantly larger weight loss than did nonexercisers. In addition, exercisers reported more favourable long-term changes in mood than did nonexercisers.

Rigid cognitive control may be harmful for weight control (Westenhoefer, 2001; Byrne et al., 2004). Dietary restraint is defined as the behavioral tendency to restrict food intake in order to reduce or maintain body weight. It has been shown that dietary restraint is not a homogeneous construct, but includes two distinct cognitive and behavioral styles: rigid control and flexible control of eating behavior (Westenhoefer, 1991; Westenhoefer, 2001). Rigid control is characterized by a dichotomous 'all or nothing' approaches to weight and eating, where periods of strict dieting alternate with periods

without any weight control efforts. Rigid control includes extreme behavioral measures such as severe restriction of energy intake, attempts to totally avoid sweets or other liked foods. Flexible control on the other hand is characterized by a graduated 'more or less' approach to eating and weight control, which is understood as a long-term or even permanent task. Studies have showed that rigid control is consistently associated with higher BMI in several samples, while flexible control is consistently associated with lower BMI and better weight loss (Westenhoefer, 2001).

Also more generally, dichotomous thinking predicts weight regain in overweight weightlosers (Byrne et al., 2004). A greater degree of dichotomous thinking at the time of at least 10% weight loss, significantly predicted weight regain at 1-year follow-up. The results suggest that it is a general dichotomous thinking style, rather than dichotomous cognitions relating specifically to food, weight and eating, which is the key predictor. Dichotomous thinking is a form of cognitive rigidity whereby individuals tend to "place all experiences in one of two opposite categories" (Beck, Rush, Shaw, & Emery, 1979, Byrne et al., 2004), instead of on a continuum. The attitude "If I'm not a total success, I'm a failure" is an example. This style of absolutist, categorical, "all-or-nothing" thinking is one of a range of cognitive distortions that have been associated with psychological disorders. Individuals with a dichotomous thinking style may be more likely than those with a more flexible cognitive style to interpret falling short of their goal weight as evidence of a total failure and to consider the weight loss that they have achieved to be inadequate and unsatisfactory, which may reduce their motivation to continue. This is supported by the fact that compared to Maintainers, regainers were more dissatisfied with their weight and less likely to perceive that they had achieved their goal weight; less vigilant with regard to weight control; and more likely to be showing evidence of weight fluctuations (Byrne et al., 2004).

Furthermore, dichotomous thinking can be seen as a part of a more general concept of psychological flexibility. Psychological flexibility is a primary determinant of mental health and behavioral effectiveness, as hypothesized by one of the more recent, empirically based theories of psychopathology, acceptance and commitment therapy (ACT; Hayes, Strosahl, & Wilson, 1999; Bond, Flaxman, & Bunce, 2008). Psychological flexibility refers to an ability to focus on the present moment and, depending upon what the situation affords, persist with or change one's (even inflexible, stereotypical) behavior in the pursuit of goals and values. People cannot focus comprehensively on the present moment, however, when their attention is directed at altering, avoiding, suppressing, analyzing, or otherwise controlling their psychological events (e.g., thoughts, feelings, physiological sensations,

images, and memories; Bond, & Flaxman, 2006; Bond, Flaxman, & Bunce, 2008). Thus, flexibility involves a reduced tendency to control internal experiences when doing so would prevent goal attainment (e.g., when avoiding fear prevents people from taking goal-directed action); instead, flexibility involves people deliberately observing their internal experiences on a moment-to-moment basis, in an open, nonelaborative, noncontrolling, and nonjudgmental manner (Hayes, Luoma, Bond, Masuda, & Lillis, 2006). This nonelaborative, nonjudgmental— or mindful—stance toward (even unwanted) internal events frees people from the need to control them or be overly guided by them; instead, it allows people to redirect their limited attentional resources to the present moment. As a result, psychologically flexible people are less emotionally disturbed (Hayes et al., 2006), and they have more attentional resources for noticing and responding effectively to goal associated opportunities that exist in the present situation. In line with this conceptualization of psychological flexibility, there are now dozens of studies that show that this characteristic predicts outcomes such as mental health, physical health, and job performance (see Hayes et al., 2006, for the complete findings of this meta-analysis). These effects of flexibility are seen even after controlling for one or more individual characteristics, like negative affectivity and locus of control (Hayes et al., 2006). Moreover, increased psychological flexibility led to stigma reduction, quality of life improvements and weight loss for obese weight losers receiving a 1-day, mindfulness and acceptance-based workshop (Lillis et al., 2009).

In order to improve the long-term outcome of treatments for obesity, it is important to understand, why most people, who lose weight, regain it. Relatively little research has been carried out on the psychological mechanisms that may be associated with successful maintenance of a new lower weight, as opposed to relapse, in obesity. This relapse appears to be attributable to the individual's inability to persist with the behavioural strategies needed to maintain the new lower weight. Successful weight loss maintenance has been related to some psychological and behavioral variables, like exercise, self-efficacy and an ability to cope with stress and dietary lapses using direct coping. Instead, a lack of knowledge and special social situations can be seen as an obstacle in changing food habits. Also, rigid cognitive control, compared to psychological flexibility, may explain difficulties in maintaining behavioral changes needed to weight loss and retaining.

It appears that weight control is a quite diverse problem. Obviously, there is no single explanation for obesity or weight regain after weight loss, but many individual descriptions. Little research to date has examined overweight people's own conceptions about factors affecting their weight. This may be an important aspect when aiming to change the behavior of overweight person. Studies have suggested

that obesity treatment failures may reflect motivational impediments to weight loss rather than limitations of the behavior change strategies per se. So, it would be useful to understand especially motivational factors for weight change in overweight people.

The purpose of this study was to find out, how obese weight controllers perceive factors affecting their weight during the follow-up of weight loss program, and how willing they are to change those factors. Secondly, we were interested in, obese persons' views of what motivates them for weight control and lifestyle changes during a follow-up period, and how much weight loss is being evaluated to impact on different areas of life. We further examined how weight changes during and after weight loss program is related to understanding of factors affecting weight and motivating weight control. Also, we were interested in how psychological flexibility (or cognitive rigidity) is related to understanding of factors affecting weight and motivating weight control.

METHOD

Participants and procedure

We investigated overweight and obese persons' perceptions about factors affecting their weight after they had received a very low calorie diet and weight maintenance and dietary counseling. Participants were overweight people, who had participated in an intervention, which aimed to investigate the effect of satiety value of food in the longer-term regulation of food intake and body weight. Initially, 99 subjects (28 men, 71 women) were chosen in the intervention, of which 82 subjects (21 men, 61 women) remained until the end of the intervention. 60 percent of participants (n=49; 12 men, 37 women) who performed the original intervention participated in the follow-up 8-9 months after the end of the treatment. Mean age of those participants was 50.8 years. Their starting BMI was approximately 34.10, post BMI 30.02 and follow-up BMI 31.16. Participant characteristics are described in table 1.

Table 1. Participant characteristics of the subjects described in this study (follow-up) and of the treated subjects who did not take part of the follow-up.

	Follow-up (n=49)	No follow-up (n=33)
Gender: female/male	37 (75.5 %)/ 12 (24.5 %)	24 (72.7 %)/ 9 (27.3 %)
Age	50.76 (9.13)	47.21 (9.16)
Starting weight (kg)	94.72 (12.32)	95.88 (11.46)
Starting BMI	34.10 (2.69)	34.26 (2.27)
End weight (kg)	83.43 (11.25)	85.59 (10.13)
End BMI	30.02 (2.82)	30.63 (2.44)
Follow-up weight (kg)	86.616 (12.70)	
Follow-up BMI	31.157 (3.32)	

There were no significant differences between those who participated in the follow-up and those who did not in background variables (gender, age, starting/end weight, starting/end body mass index) (table1).

In a previous intervention, participants had weight loss period of about 8 weeks during which they had a very low calorie diet (VLCD, 600 kcal/ day) and dietary counselling during 7 group sessions. In dietary counselling participants were taught principles of very low calorie diet and general principles and practices of successful weight management. After weight loss program there was a 24-weeks weight maintenance period where weight-reduced participants were randomised into two groups: Higher-Satiety Food Group, which received foods with higher satiety value as a part of the weight maintenance, and Lower-Satiety Food Group, which received food with lower satiety value as a part of the weight maintenance diet. Test foods for intervention were dairy products (yoghurt type), soft bread, crispbread, cheese, cold cuts and vegetable pattie. Foods with higher satiety value were richer in protein and fibre than lower satiety foods. The way of using the test foods and other dietary counselling was the same in both groups. Participants were instructed to intake 30 % of individually determined daily energy from test foods. Participants received the test foods from the University of Kuopio every two weeks. In every visit the weight losers' body weight was measured and they were instructed about the use of test foods and weight-management diet in general.

There were no differences in weight loss between the High and Low satiety groups at any point of the treatment. Thus, in this study we did not investigate the differences between the groups. The average weight loss (n = 49) from the beginning of the weight loss program to follow-up was 8.11 (6.06) kg, 8.56 (6.21) %, ranging from 5.40 % weight gain to 18.71 % weight loss. The average weight loss during the treatment period (8+24 weeks) was 11.29 (4.78) kg, 11.87 (4.56) % (range 1.08 – 22.39 %) for those persons participating to follow-up (n=49), and 10.28 (4.68) kg, 10.62 (4.33) % (range - 0.71-19.73) for those not participating to follow-up (n=33). The mean weight loss for all persons participating in the study during the treatment period (n=82) was 10.89 (4.73) kg, 11.37 (4.49) % (range 0.71 – 22.39 %). The average weight gain during the follow-up was 3.19(3.47) kg, 3.31(3.46) % ranging from 4.56 % weight loss to 12.64 % weight gain (n=49).

Measurements

8-9 months after the end of the treatment obese weight controllers participated in a group session, where they were asked to describe factors affecting their weight and factors motivating them for weight loss and lifestyle changes. Factors affecting weight were asked using an open question (weight

analysis questionnaire). Participants were asked “which different factors affect your weight? They can support or complicate weight control. Think question as extensively as possible. Factors affecting weight can be for example habits and customs in specific situations, tendencies, desires, factors concerning social relationships or life situation, thoughts and feelings”. They were given a piece of paper, having a radial diagram printed on it. A radial diagram was used to show relationships of a core element (weight). (Similar diagram is used and can be printed at the Word Office Power Point presentations.) The word “weight” was printed middle of the diagram, and it was surrounded by eight circles. The weight controllers were asked to write down in/on the circles whatever variables they thought would have effect on their own weight (more that eight variables were allowed to be reported). “An open weight analysis assessment” using a radial diagram was chosen, because we didn’t want to limit participants’ views about factors affecting their weight. On the other hand, we have been using the method successfully in clinical practice with groups over several years. After naming the variables participants were asked to evaluate how large impact or effect those factors had their weight control using a scale 1-10 (1=only small effect, 10=major effect). Similarly, they were asked to evaluate their willingness to make a change for those factors using a scale 1-10 (1=being little or not at all willing to make a change for that particular factor, 10=being very willing to make a change). Participants’ answers of factors affecting weight were classified into 18 categories. Categories were made inductively by combining similar answers into same category. Description and examples of categories are presented in table 2.

Secondly, participants were asked about factors which motivate them for weight control and lifestyle changes. Here we used ready made classes of different areas of life (value categories, see table 3). Value categories similar as applied in the Acceptance and Commitment Therapy (ACT) were used. In ACT values are used as motivational tools. The purpose is to help clients select directions for their lives that are congruent with what is deeply important to them and establish goals supporting movements in those directions (Dahl, Plumb, Stewart, & Lundgren, 2009; Hayes et al., 2006; Hayes, & Smith, 2005; Lillis, Hayes, Bunting, & Masuda, 2009). The motivational or value analysis includes ten domains. They are intimate relationships, parenting, family, social network, work, education and personal development, leisure activity, spirituality, community involvement and health (for example, Dahl et al., 2009; Hayes, & Smith, 2005). Participants were asked “which different factors in different life areas motivate you in losing weight or when making lifestyle changes? What personal reasons do you have for losing weight or for making lifestyle changes? For example, which factors considering

intimate relationships motivate you in weight control? Which factors considering intimate relationships could motivate you to make lifestyle changes? Try considering similarly all domains in the questionnaire”. In addition, participants were asked to evaluate, how important those causes are, or how strong motivating effect those factors have using a scale 1-10 (1=motivates little, 10=motivates strongly). Similarly, they were asked to evaluate, how much weight loss or getting desired weight would have impact for different life areas, which they had mentioned, using scale 1-10 (1=very little effect, 10=very much effect).

Psychological flexibility was assessed by the Acceptance and Action Questionnaire (AAQ-II, Boelen &, Reijntjes, 2008; Hayes et al., 2006), which is a 10-item Likert-type questionnaire that assesses people’s ability to take a nonelaborative, nonjudgmental approach to their internal events, so that they can focus on the present moment and act in a way that is congruent with their values and goals and not their internal events (e.g., fears, urges, and prejudices). The questions of AAQ-II are; 1.Its OK if I remember something unpleasant, 2. My painful experiences and memories make it difficult for me to live a life that I would value, 3. I’m afraid of my feelings, 4. I worry about not being able to control my worries and feelings, 5. My painful memories prevent me from having a fulfilling life, 6. I am in control of my life, 7. Emotions cause problems in my life, 8. It seems like most people are handling their lives better than I am, 9. Worries get in the way of my success, 10. My thoughts and feelings do not get in the way of how I want to live my life. The Acceptance and Action Questionnaire has good reliability and validity (Boelen &, Reijntjes, 2008)

Statistical analysis:

Participants’ answers of factors affecting weight were reported in frequencies. Means of importance and willingness to change evaluations were calculated for those participants who had mentioned a particular factor. For motivational factors, means of importance and impacts of weight loss to different motivating life areas were calculated for those participants who had mentioned a particular life area. Also motivational factors were reported in frequencies.

Relations between weight changes, during (the 8+24 week treatment period) and after weight loss program (from post measurement to 8 months), and naming of different variables affecting weight were calculated by binary logistic regression. Correspondingly, correlations between weight changes and

importance/ willingness to change were calculated using Spearman correlation. Similar analyses were made about relations between weight changes and motivational factors using binary logistic regression and Spearman correlation.

Relations of psychological flexibility to factors affecting weight and motivating weight control were calculated by Spearman correlation.

RESULTS

Factors affecting weight

The most frequently named variables affecting weight were exercise and eating habits (Table 2). The majority (90 %) of participants named exercise as a factor affecting weight. Eating habits was named by 84 % of the participants. About half of the participants mentioned friends and other social relationships (51 %) and family (43 %) as factors affecting weight. One third of the participants reported mood affecting weight. Stress was mentioned equally often. Interestingly, about one fifth (22 %) of the participants stated that health had a relationship with weight, but those who named it estimated it affecting weight very much (mean 9.05, SD 1.38). It could be hypothesized that they were people who had some obvious health problem affecting weight. Also self-control was mentioned only by 18 % of participants. Surprisingly, only four of 49 persons (8 %) reported appearance as a factor related to weight, but those four persons regarded it as an important one (mean 8.75, SD 0.50) and were very willing to affect their appearance by losing weight (mean 8.00, SD 1.83).

Participants were asked to evaluate how large impact or effect those factors named by them had on their weight or weight control. Health (mean 9.05, SD 1.38), rest (mean 8.93, SD 0.84) and appearance (mean 8.75, SD 0.50) were estimated as the most important variables by those who had reported them. However, there were quite small differences between importance-estimates (Table 2). All mentioned variables affecting weight were estimated to be high in importance.

Participants were most willing (see Table 2) to change their life situation (mean 8.73, SD 1.10), exercise (mean 8.39, SD 4.62) and appearance (mean 8.00, SD 1.83) and least willing to make a change for friends and other social relationships (mean 5.25, SD 3.25), family (mean 5.65, SD 3.36) and holidays/visits (mean 5.85, SD 3.11).

Table 2: Factors affecting weight as reported by the obese weight controllers. The table show the frequency of the variable, the mean (and standard deviation) value for importance of the variable (scale 0-10), and the mean (and standard deviation) value for willingness to change that variable (scale 0-10). Some examples of the kind of descriptions included in the category are also given.

Weight factor	Frequency % (n)	Importance	Willingness to change	Description/ examples
1. Exercise	89.8 % (44)	8.07 (2.05)	8.39 (4.62)	Exercise, leisure time activities, barriers of exercise
2. Eating habits	83.7 % (41)	8.35 (1.37)	7.83 (1.80)	Snacking, regularity of eating, meal size
3. Friends and other social relationships	51.0 % (25)	7.77 (1.89)	5.25 (3.25)	Friends, peer support
4. Family	42.9 % (21)	8.00 (2.01)	5.65 (3.36)	Family relations, support of the family
5. Work	34.7 % (17)	6.88 (2.04)	6.18 (2.60)	Works' quality, balance of work and spare time, way to work
6. Stress	32.7 % (16)	8.03 (2.52)	7.97 (1.88)	Stress, hurry, lack of time
7. Mood	32.7 % (16)	7.40 (2.32)	6.77 (2.87)	Melancholy, good mood, exhilaration, comfort
8. Knowledge	28.6 % (14)	8.21 (1.76)	6.77 (3.65)	Knowledge how to eat, choices on grocery store
9. Life situation	24.5 % (12)	8.17 (1.59)	8.73 (1.10)	Menopause, age, loneliness, abode
10. Health	22.4 % (11)	9.05 (1.38)	7.83 (3.34)	Health, health problems, maladies, medicines
11. Holidays, visits	20.4 % (10)	6.65 (2.29)	5.85 (3.11)	Holidays, visits, parties
12. Self control	18.4 % (9)	8.29 (2.10)	6.95 (3.17)	Self control, self-esteem, motivation, personal willingness and decision
13. Rest and tiredness	16.3 % (8)	8.93 (0.84)	7.75 (2.25)	Sufficient rest, tiredness, paucity of sleep
14. Seasonal variables	14.3 % (7)	7.43 (1.40)	7.71 (2.14)	Season, darkness, weather
15. Alcohol	14.3 % (7)	6.57 (2.64)	8.00 (1.91)	
16. Life rhythm	12.2 % (6)	6.67 (2.80)	6.00 (2.00)	Regularity, active life rhythm, staying up late
17. Watching television	10.2 % (5)	7.00 (1.22)	6.40 (2.41)	Watching television, reading
18. Appearance	8.2 % (4)	8.75 (0.50)	8.00 (1.83)	

Motives for weight control and lifestyle changes

Almost every participant mentioned intimate partnership (92 %) and health (90 %) as a motivating factor for weight control. More than 80 % reported also leisure activity, work and social network. Health was the most important reason for weight control or lifestyle changes (mean 9.24, SD 0.88). Weight lost was also evaluated to have the biggest impact on health (mean 9.37, SD 0.9). Other factors having a strong motivating effect for life style changes were leisure activities (mean 8.03, SD 1.99) and social factors like intimate relationships (mean 7.86, SD 2.32), care giving (mean 7.51, SD 2.81) and social network (mean 7.10, SD 2.52). Community involvement (mean 3.55, SD 2.78) and spirituality (mean 3.95, SD 3.28) were reported as less important motivating factors. In addition to health, weight loss was reported to have a notable impact on leisure activities (mean 8.18 SD 1.97), work (mean 7.44, SD 2.42) and education and personal development (mean 7.27, SD 2.63).

Table 3: Factors motivating weight control and life style changes. The table show the frequency of the variable, the mean (and standard deviation) value for importance of the variable (scale 0-10), and the mean (standard deviation) value for impact of weight lost to that variable (scale 0-10). Some examples of the kind of descriptions included in the category are also given.

Motive	Frequency % (n)	Importance	Impact of weight lost	Examples
1. Intimate relationships	91.8 % (45)	7.86 (2.32)	7.23 (2.44)	Feeling more self-confident and attractive, partner's support and acceptance
2. Health	89.8 % (44)	9.42 (0.88)	9.37 (0.9)	Improved health, having less pains
3. Leisure activity	83.7 % (41)	8.03 (1.99)	8.18 (1.97)	More comfortable to exercise
4. Social network	81.6 % (40)	7.51 (2.81)	6.92 (2.53)	More comfortable to be in other's company, others motivate to continue dieting
5. Work	81.6 % (40)	7.03 (2.69)	7.44 (2.42)	Job wellbeing and performance, credibility
6. Care giving	75.5 % (37)	7.51 (2.81)	7.00 (2.72)	Being healthy because of children, transferring food habits
7. Family	75.5 % (37)	6.79 (2.81)	6.81 (2.73)	Relatives' comments or cheer, to become accepted
8. Education and personal development	69.4 % (34)	6.94 (2.82)	7.27 (2.63)	Improved self-esteem, dieting as a mental touchstone
9. Spirituality	40.8 % (20)	3.95 (3.28)	4.16 (3.27)	Achieve mental and physical balance, ethical consuming
10. Community involvement	38.8 % (19)	3.55 (2.78)	3.68 (2.89)	Being example, credibility

Relationships between weight change and factors affecting weight

Weight change during weight loss program (weight changes during 8+24 weeks) was related to naming of exercise ($B=0.265$, $p=0.042$, $\text{Exp}(B)=1.304$) and knowledge ($B=0.199$, $p=0.019$, $\text{Exp}(B)=1.220$) as factors affecting weight. Participants, who had mentioned knowledge as a factor affecting weight, had lost less weight during the active treatment and maintenance period (8+24 weeks). Surprisingly, those few ($n=5$), who had not mentioned exercise affecting their weight had lost more weight. The average weight loss during the treatment period (8+24 weeks) was 10.83 (4.38) kg, 11.40 (4.25) % (range 1.08 – 19.08 %) for those persons who had mentioned exercise affecting their weight and 15.40 (6.66) kg,

16.03 (5.61) % (range 10.04 – 22.39 %) for those who had not mentioned it. Thus, naming exercise as a factor affecting weight was associated with losing less weight during the treatment. Similar association was not perceived in the follow-up. Moreover, all participants who did not mention exercise as a factor affecting weight (n=5) had gained weight during follow-up (range 1.20-6.10 kg, 1.26-7.23 %, mean 3.26 (1.81) kg). In addition, participants, who had gained more weight during follow-up, had more likely mentioned stress ($B=-0.223$, $p=0.027$, $\text{Exp}(B)=0.800$) as a factors affecting weight.

Lower weight loss during the 8+24 week weight loss program was significantly related to willingness to make a change for alcohol consumption ($r=-0.764$, $p=0.046$, $n=7$) for those participants who had reported alcohol as a factor affecting weight. In other words, participants who had lost less weight during the weight loss program were more willing to change their alcohol consumption. Besides, weight change during the 8 month follow-up was significantly related to willingness to make a change for eating habits ($r=0.348$, $p=0.030$, $n=39$), and rest and tiredness ($r=0.798$, $p=0.018$, $n=8$). Persons who had gained more weight during follow-up were more willing to change their eating habits and the amount of rest and tiredness. There was an almost significant correlation between weight gain during follow-up and willingness to change knowledge ($r=-0.539$, $p=0.058$, $n=13$). Participants, who gained less weight during follow-up, were more willing to make a change for their knowledge. As a conclusion, better weight managing results were related to being more willing to make a change for one's knowledge. Whereas, poorer outcome in weight loss was related to seeing exercise and knowledge as factors affecting weight and being willing to change one's alcohol consumption, and poorer outcome in weight managing after weight loss was related to seeing stress affecting weight and being more willing to change eating habits and rest and tiredness.

Relationships between weight change and motivators

Weight change during the 8+24 week weight loss program was related to reporting of intimate partnership as a motivating factor ($B=0.448$, $p=0.016$, $\text{Exp}(B)=1.566$). Those few (n=4), who did not report intimate partnership as a reason for weight control or lifestyle changes, had lost more weight. Thus, the results suggested that those who named intimate relationship as a reason for lifestyle changes had lost less weight during the active 8+24 week treatment period. Moreover, weight gain during the follow-up was related to reporting of education and personal development ($B=-0.282$, $p=0.028$,

Exp(B)=0.755) as a motivator for weight control. In other words, participants, who reported education and personal development motivating them for weight control, gained more weight during the follow-up.

Relationships between psychological flexibility and factors affecting weight:

Psychological flexibility was related to willingness to change life situation ($r=0.887$, $p=0.000$, $n=11$) and life rhythm ($r=0.883$, $p=0.020$, $n=6$). The more psychologically flexible weight controllers were, the more willing they were to change their life situation and life rhythm. There was also an almost significant positive correlation between psychological flexibility and willingness to change health ($r=0.660$, $p=0.053$, $n=9$); more psychologically flexible participants were more willing to make a change for their health. Furthermore, psychological flexibility was related to importance of self-control as a factor affecting weight ($r=0.749$, $p=0.033$, $n=8$). That means that more psychologically flexible persons evaluated self-control being a more important factor regarding weight.

Relationships between psychological flexibility and motivators

What comes to connections between psychological flexibility and factors motivating weight control, psychological flexibility was related to impact of weight loss to health ($r=0.341$, $p=0.022$, $n=45$). That means, participants who had better psychological flexibility evaluated that weight loss would have more impact on their health. There was an almost significant correlation between psychological flexibility and importance of social network ($r=-0.311$, $p=0.054$, $n=39$) as a motivating factor to weight control. Social network motivated more persons, who had lower psychological flexibility.

CONCLUSIONS

The purpose of this study was to examine how overweight weight controllers perceive and describe factors affecting their weight, and especially, their view of motivating factors for weight control and lifestyle changes. Moreover, we were interested in whether there were associations between those perceptions or motivators and weight changes during the weight loss program and follow-up. One more question was how psychological flexibility was related to the weight perceptions and motives.

We have been studying obese weight controllers' perceptions of factors affecting their weight, and obese people's views what motivates them for behavioural changes. These perceptions and verbal descriptions might be important to study as such, because they could be used during nutritional counselling or during behavioural treatment programs. We must keep in mind when drawing conclusions from this study, that how people explain their own behaviour is not always in accordance with the truly causes of that behaviour. However, the explanation given by the participants may be a valuable hypothesis. It gives an alternative from where the therapist or the advisor may start seeking the causes.

The most frequently named variables affecting weight by obese weight controllers were exercise and eating habits. The effect of exercise and eating habits was named by more than 80 % of the research participants. About half of the participants mentioned friends and other social relationship and family as factors affecting their weight. Among factors affecting weight, especially healthiness, sufficient rest and appearance were estimated to have large impact or effect on weight or weight control by those who had reported them. Weight controllers were most willing to make changes for their life situation, exercise and appearance and least willing to make a change for their social relationships like friends and family and also for holidays/visits. Thus, on the basis of our study obese persons seem to be very motivated to deal with their life situation factors and exercise habits, at least after a weight control program. This interest could be used in clinical applications when working with health behavior changes. Moreover, besides exercise and eating habits, social relationships deserve to be considered as important factors explaining variation in weight among obese weight controllers and these observations should also be taken into account when giving (nutrition) counselling to overweight people.

Almost every participant mentioned intimate partnership (92 %) and health (90 %) as a motivating factor for weight control or lifestyle changes. More than 80 % reported also leisure activity,

work and social network. Health was evaluated to be the most important reason or motivator for weight control or lifestyle changes. Other important motivators were reported to be leisure time activities, and social factors such as intimate relationships, care giving and social network. Instead, weight loss was reported to have the most notable impact on health, leisure time activities, work and education and personal development. These results suggest that it would be useful to take into consideration the effect of weight loss to health, social relationships, work, personal development and leisure activity when treating obesity. In accordance with our results, some earlier studies have suggested that obesity treatment failures may reflect motivational and contextual impediments to weight loss rather than limitations of the behavior change strategies per se (Tinker &, Tucker, 1997), so these motivational aspects may be especially critical in practise.

According to the obese clients who took part in a weight control program, the role of social factors in weight control was diverse. Social factors, like family relations and friends, were reported to have an impact on weight. On the other hand, although the obese persons realized the importance of social factors on weight control, they were relatively unwilling (when compared to other factors) to change them. This may be accounted for that many weight controllers saw social relations being supportive in weight loss, instead of being obstacles. Social factors seemed also to function as motivators for weight control or weight loss. Still, it was reported that weight loss has relatively little impact on social factors as compared to other life areas, like health and leisure activities.

Surprisingly, those few subjects who had not mentioned exercise affecting their weight had lost more weight during the 8+24 week weight loss program. Corresponding connection between exercise as a factor affecting weight and weight change wasn't perceived in the follow-up. Actually, all subjects who did not mention exercise as a factor affecting weight had gained weight during follow-up. So, our data suggest that exercise may not be important in weight losing during supervised weight loss program and can even moderate weight loss. In stead, as preceding results suggest exercise may be especially critical for weight loss maintenance over time (Dohm, Beattie, Aibel &, Striegel-Moore, 2001; Jeffery et al., 2000; Tinker &, Tucker, 1997; Wadden et al., 1998; Wing et al., 2008). Researches has suggested that initial focus on diet is associated with short-term weight loss, while exercise-related motivational factors, with a special emphasis on intrinsic sources of motivation play a more important role in longer term weight management (Teixeira et al., 2006; Wadden et al., 1998).

Participants who had lost less weight during weight loss program were more willing to change their alcohol consumption. It may be that persons who have some problems with alcohol consumption

are less able to make lifestyle changes. Correspondingly, participants who had gained more weight during follow-up were more willing to change their eating habits and amount of rest. So, participants who had managed their new lower weight better were less willing to change their eating and resting habits in the follow-up. Maybe these are things in which weight controllers have faced troubles with. Difficulties in weight loss or maintenance may make people more willing to handle with their eating, drinking and resting habits. On the other hand, these results could be concluded so that, concentrating too much on changing eating, drinking and resting habits is not effective in weight lost and maintenance. We can not be sure, if poorer weight managing has increased willingness to make changes or if willingness to change eating and rest and tiredness has weakened weight managing results.

Moreover, participants, who had gained more weight during follow-up, had more likely mentioned stress as factors affecting weight. Studies have shown that stressful life events and the ability to cope with stress appear to be associated with successful weight maintenance (Byrne, 2002). For example, Kayman and colleagues (1990) reported that in response to stress, unsuccessful weight-loss maintainers were more likely to eat more, sleep more, or wish whatever was causing the stress would go away; in contrast, successful weight-loss maintainers confronted the source of the stress directly (Kayman et.al., 1990, Byrne, 2002). In our data, stress was usually seen impeding weight control, when mentioned as a factor affecting weight. Mentioning “stress” was also related to poorer weight control. So, stress seems to complicate weight loss maintenance. Clinically, it could be concluded that teaching coping strategies to handle stress could be useful in weight control programs.

Reporting knowledge as a factor affecting weight was related to lower weight loss during the weight loss program. Instead, those who gained less weight during follow-up were more willing to make change for their knowledge. Previous findings have indicated that a lack of knowledge can be an obstacle in changing food habits (Koikkalainen, 2001). In the present study, weight controllers had been dispensed knowledge during the intervention. It is possible that, those losing less weight during weight loss program (8+24 weeks) had difficulties to use the knowledge they got. The class of knowledge included also choices in the grocery store, which suggest, that not only willingness to get more knowledge, but also willingness to use it in choice situations is important in maintaining weight loss.

As a conclusion, better weight managing results were related to being more willing to make a change for one’s knowledge and buying routines. Poorer outcome in weight loss was related to seeing

exercise and knowledge as factors affecting weight and being willing to change one's alcohol consumption, and poorer outcome in weight managing after weight loss was related to seeing stress affecting weight and being more willing to change eating habits and rest in the follow-up of weight loss program.

Participants, who didn't see intimate partnerships as a reason for weight control or lifestyle changes, had lost more weight during weight loss program. In addition, a bit surprisingly, participants, who reported education and personal development motivating them for weight control, had gained more weight during follow-up. In some previous studies, relationships with family, friends, and intimate partners have found to have positive influences on weight loss and maintenance (Tinker & Tucker, 1997). On the other hand, seeking help from others may be an ineffective way of coping with a dietary lapse suggesting a possible dearth of self-sufficiency or self-efficacy (Dohm et.al, 2001). So, these precede and present results suggest that leaning on others may not be good motivator or way of coping in weight loosing. Instead, earlier results have indicated, that autonomous or intrinsic motivation to participate in a weight-loss program (Williams et al., 1996) and exercise (Tinker & Tucker, 1997, Wadden et al., 1998, Wing et al., 2008) is especially critical for weight loss maintenance. Whereas extrinsic types of motivation are contingent on reaching a goal separated from the behavior (e.g., getting a reward, compliance with others' expectations, not feeling guilty), intrinsically motivated behaviours originate in the person, are internally regulated, and are inherently enjoyable and interesting.

Because weight lost motivators were asked only in the follow-up, it can not be discriminated what are the causes and what are the consequences of weight changes. It is possible that weaker weight control after weight loss program has increased the meaning of personal development. Personal development and its relationship with weight control have been pointed out in earlier research. The researchers interviewed persons who had lost at least 20% of their initial body weight and were able to maintain their new lower weight for 2 years. The female subjects, in particular, reported that since losing weight they had become more confident, self-assured and autonomous, and more capable of taking control of, and responsibility for their lives (Colvin & Olson, 1983, Byrne, 2002).

The more psychologically flexible weight losers were, the more willing they were to change their life situation, life rhythm and health. As a clinical application, this may mean that working with psychological flexibility (including values) may increase willingness to make lifestyle changes. In addition, more psychologically flexible persons evaluated self-control affecting more their weight. The

class of self-control consisted of motivational factors and factors concerning self appreciation, factors being personal and internal. So, our results suggest that persons having better psychological flexibility may feel being more able to affect (themselves) their weight. This is also called an internal weight locus of control, which means that the person believes that his/her behavior or attributes determines his/her weight. The belief that one's weight is due to factors outside his or her own control, such as luck, genes, fate, or social support, is instead labeled a belief in external weight locus of control (Rotter, 1966; Stottland & Zuroff, 1990). Internal weight locus of control has been proposed as a predictor of success in weight loss (Stottland & Zuroff, 1990).

Participants who had better psychological flexibility also evaluated that weight loss would have more impact to their health. This may reflect the notion that persons with better psychological flexibility see that their healthiness is in their own hands, and they can affect it by losing weight. This result also points out the possibility that increase in psychological flexibility may influence how a person understands the relationship between weight loss and health. Instead, social network motivated more persons who had lower psychological flexibility. Thus, people having lower psychological flexibility may be more dependent on others acceptance and support. As already mentioned, leaning on others may be an ineffective motivator and way of coping in weight control suggesting a possible dearth of self-sufficiency or self-efficacy (Dohm et.al, 2001).

Attempts are often made to influence consumer behavior by offering information from the expert angle on correct procedures or risks associated with undesirable behavior. However, it might be asked, to what extent does the information really produce the desired changes? Assimilation of information to become a part of one's own habits would seem to be a question of motivation and values. Willingness to use knowledge seems to be important differentiating factor in successful weight loss maintenance.

Explanations and motives of weight controllers should be considered as tools for nutritional counselling when treating obesity. It would be useful to take into consideration the effect of weight loss to health, social relationships, work, personal development and leisure activity when motivating obese persons to lifestyle changes. The role of social relationships seems to be quite diverse in weight loss. Weight controllers appreciate social support and social factors are important motivators for weight loss, but our data suggests that leaning on others may be ineffective in weight loss. Increasing psychological flexibility could make weight losers more autonomous and improve their internal weight locus of control. Moreover, increase in psychological flexibility could influence how a person understands the relationship between weight loss and health. In weight loss and maintenance, it would also be useful to

pay attention to sufficient rest and coping with stress. Teaching coping strategies to handle stress could be useful in weight control programs.

However, these results can be generalised only to the obese persons who have participated in weight loss program including nutritional counselling. These obese weight controllers have had appropriate information about weight loss and control. Also, peer support and conversations with group mates might have affect participants' perceptions and motives. Using theoretical framework of the Transtheoretical Model of Health Behavior Change (TTM, Riebe et al., 2005) subjects of the present study may supposed to have been at least in the preparation phase, and most of them also in the action or maintenance phase meaning that they have taken behavioral steps toward the goal, and at least some of them has recently achieved the goal behavior, and continued the goal for at least 6 months. The results may be different in other overweight or normal weight groups.

REFERENCES

- Boelen, P.A., & Reijntjes, A. (2008). Measuring Experiential Avoidance: Reliability and Validity of the Dutch 9-item Acceptance and Action Questionnaire (AAQ). *Journal of Psychopathology and Behavioral Assessment, 30*, 241–251.
- Bond, F. W., Flaxman, P. E., & Bunce, D. (2008). The influence of psychological flexibility on work redesign: mediated moderation of a work reorganization intervention. *Journal of Applied Psychology, 93*(3), 645–654.
- Brownell, K.D. (2010). The humbling experience of treating obesity: Should we persist or desist? *Behaviour Research and Therapy, 48*, 717-719.
- Byrne, S.M. (2002). Psychological aspects of weight maintenance and relapse in obesity. *Journal of Psychosomatic Research, 53*, 1029– 1036.
- Byrne, S.M., Cooper, Z., & Fairburn, C.G. (2004). Psychological predictors of weight regain in obesity. *Behaviour Research and Therapy, 42*, 1341–1356.
- Carels, R.A., Harper, J., & Conrad, K. (2005). Qualitative perceptions and caloric estimations of healthy and unhealthy foods by behavioral weight loss participants. *Appetite, 46*, 199-206.
- Cooper, Z., Doll, H.A., Hawker, D.M., Byrne, S., Bonner, G., Eeley, E., O'Connor, M.E., & Fairburn, C.G. (2010). Testing a new cognitive behavioural treatment for obesity: A randomized controlled trial with three-years follow-up. *Behaviour Research and Therapy, 48* (8), 706-713.
- Dahl, J.C., Plump, J.C., Stewart, I., & Lundgren, T. (2009). *The art and science of valuing in psychotherapy. Helping clients discover, explore and commit to valued action using acceptance and commitment therapy*. Oakland: New Harbinger.
- Dohm, F.-A., Beattie, J.A., Aibel, C., & Striegel-Moore, R.H. (2001). Factors differentiating women and men who successfully maintain weight loss from women and men who do not. *Clinical Psychology, 57*, 105-117.
- Drapkin, R., Wing, R., & Shiffman, S. (1995). Responses to hypothetical high risk situations: Do they predict weight loss in a behavioral treatment program or in a context of dietary lapses? *Health Psychology, 14*(1), 427-434.
- Hayes, S. C., Luoma, J. B., Bond, F. W., Masuda, A., & Lillis, J. (2006). Acceptance and commitment therapy: Model, processes and outcomes. *Behaviour Research and Therapy, 44*, 1–25.

Hayes, S.C., & Smith, S. (2005). *Get out of your mind and into your life. The new acceptance and commitment therapy*. Oakland: New Harbinger.

Jeffery, R.W., Drewnowski, A., Epstein, L.H., Stunkard, A.J., Wilson, G.T., Wing, R.R., & Hill, D.R. (2000). Long-term maintenance of weight loss: Current status. *Health Psychology, 19*(1), 5-16.

Jeffery, R.W., French, S. A., & Rothman, A.J. (1999). Stage of change as a predictor of a success in a weight control in adult women. *Health Psychology, 18*(5), 543-546.

Koikkalainen, M. (2001). Ruokailutottumusten muuttamisen esteet sydänpotilailla. *Kuopion yliopiston julkaisuja D. lääketiede 262*. ISBN 951-781-862-9.

Koikkalainen, M., Mykkänen, H., Erkkilä, A., Julkunen, J., Saarinen, T., Pyörälä, K., Uusitupa, M., & Lappalainen, R. (1999). Difficulties in changing the diet in relation to dietary fat intake among patients with coronary heart disease. *European Journal of Clinical Nutrition, 53*, 120-125.

Lillis, J., Hayes, S.C., Bunting, K., & Masuda, A. (2009). Teaching acceptance and mindfulness to improve the lives of obese: A preliminary test of a theoretical model. *Annals of Behavioral Medicine, 37*, 58-69.

Linde, J.A., Rothman, A.J., Baldwin, A.S., & Jeffery, R.W. (2006). The impact of self-efficacy on behavior change and weight change among overweight participants in a weight loss trial. *Health Psychology, 25*(3), 282-291.

Riebe, D., Blissmer, B., Greene, G., Caldwell, M., Ruggiero, L., Stillwell, K.M., & Nigg, C.R. (2005). Long-term maintenance of exercise and healthy eating behaviors in overweight adults. *Preventive Medicine, 40*, 769-778.

Rigsby, A., Gropper, D.M., & Gropper, S.S. (2009). Success of women in a worksite weight loss program: Does being part of a group help? *Eating Behaviors, 10*, 128-130.

Stottland, S., & Zuroff, D. (1990). A new measure of weight locus of control: The dieting believes scale. *Journal of Personality Assessment, 54*(1&2), 191-203.

Teixeira, P.J., Going, S.B., Houtkooper, L.B., Cussler, E.C, Metcalfe, L.L., Blew, R.M., Sardinha, L.B., & Lohman, T.G. (2006). Exercise motivation, eating, and body image variables as predictors of weight control. *Medicine & Science in Sport & Exercise, 38*(1), 179-188.

Tinker, J.E., & Tucker, J.A. (1997). Motivations for weight loss and behavior change strategies associated with natural recovery from obesity. *Psychology of Addictive Behaviors, 11*(2), 98-106.

Wadden, T.A., Vogt, R.A., Foster, G.D., & Anderson, D.A. (1998). Exercise and the maintenance of weight loss: 1-year follow-up of a controlled clinical trial. *Journal of Consulting and Clinical Psychology, 66*(2), 429-433.

Westenhoefer, J. (2001). The therapeutic challenge: behavioral changes for long-term weight maintenance. *International Journal of Obesity, 25*(1), 85–88.

Williams, G.C., Grow, V.M., Freedman, Z.R., Ryan, R.M., & Deci, E.L. (1996). Motivational predictors of weight loss and weight-loss maintenance. *Journal of Personality and Social Psychology, 70*(1), 115-126.

Wing, R.R., Papandonatos, G., Fava, J.V., Gorin, A.A., Phelan, S., McCaffery, J., & Tate, D.F. (2008). Maintaining large weight losses: The role of behavioral and psychological factors. *Journal of Consulting and Clinical Psychology, 76*(6), 1015–1021.