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**Seasonal Variations in Self-Determined Motivation,
Overtraining and Athlete Burnout**

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Forord

Utan foreldra mine ville eg ikkje vore der eg er i dag. Ein stor takk til dei for framifrå oppseding, læring, stønad, idretts glede og interesse for meg og mi utvikling, eg er Dykk evig takksam!

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Til slutt vil eg sitere Stephen Covey, der han illustrerer med ein setning, det eg etter beste evne har prøvd å illustrere med 53 sider:

“Motivation is a fire from within. If someone else tries to light that fire under you, chances are it will burn very briefly”

Abstract

The aim of present study was to investigate if variations in self-determined motivation and symptoms of overtraining, over the course of a competitive season for elite Norwegian cross-country skiers (n=13), could predict variations in athlete burnout. Participants responded to a questionnaire assessing self-determined motivation as well as burnout questionnaire at three time points (T 1, T 2, T 3) and overtraining symptoms at two time points (T 2, T 3). Findings indicate that self-determined motivation and amotivation is negatively and positively linked, respectively to burnout dimensions throughout the season. Symptoms of overtraining are not to be viewed as a general moderator for athlete burnout. Over the course of a season a relationship between elevated scores on amotivation and increasing burnout scores, was observed. An increase in self-determined motivation occurred simultaneously as self-determination reveals the strongest negative relationship to burnout dimensions. This is in line with previous studies highlighting the relationship between self-determined motivation and burnout propensity and that this relationship might have seasonal variations (Cresswell & Eklund, 2005; Lemyre et al., 2006; Lemyre et al., 2007). Coaches and athletes needs to be aware to the possible adaptive sides of monitoring self-determined motivation and amotivation, when steering clear of athlete burnout.

Keywords: Self-determination, athlete burnout, overtraining, cross-country skiing, elite level

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1.0 Purpose

Recently, successful Norwegian cross-country skiers have competed in World Championships in addition to provide top level international results, at junior ages. The Norwegian national team is also largely represented by young athletes. It is an interesting development, taking in consideration the extended training quantity needed to perform at elite level in cross-country skiing (Rusko, 2003). It has been suggested that junior athletes competing at senior level are more vulnerable to athlete burnout (Gould, Udry, Tuffey & Loehr, 1996a; Gustafsson, Kenttä, Hassmén, Lundquist & Durand-Bush, 2007). Leaders and coaches need to be aware the challenges one might be faced with, in such situations. High initial motivation and the ability to endure hard and exhaustive training characterize top level athletes (Jones, Hanton & Connaughton, 2007). If combining this with inexperience, athletes possibly have the drive to induce and develop both symptoms of overtraining and athlete burnout (Gustafsson et al., 2007). Such behavioral manifestations are meaningfully linked to motivational aspects such as feelings of self-determination for one's activity (Lemyre, Roberts & Stray-Gundersen, 2007). One's motivationally drive to pursue high athletic goals is crucial in regard to this behavioral development.

The aim of this study is to add to current body of knowledge; investigating how seasonal variations in self-determined motivation and overtraining symptoms are linked to burnout propensity among cross-country skiers competing at the elite level. This might be used as a tool for coaches and leaders to help their athletes steer away from maladaptive behavioral consequences.

2.0 Theory

2.1. Theoretical considerations

Much of the research on motivation and burnout has been from Self-determination theory perspective (Cresswell & Eklund, 2005; Hodge, Lonsdale & Ng, 2008; Lemyre et al., 2007; Lemyre, Treasure & Roberts, 2006). It has also been suggested that the process of burnout is multidimensional in nature (Cresswell & Eklund, 2006; Gould, 1996). Factors like training stress (Gustafsson et al., 2007; Lemyre et al., 2006; Silva, 1990) and self-determined motivation (Cresswell & Eklund, 2005; Hodge et al., 2008; Lemyre et al., 2007; Lemyre et al., 2006) are variables that have been meaningfully associated with athlete burnout in former research.

2.2. Self-Determination Theory

Whatever activity an individual engages in, the outcome is often a result of one's engagement or motivation. This concerns energization, direction of effort and persistence in the activity (Deci & Ryan, 2000). Motivation is highly valued in many contexts, because of its main outcome: productivity. This desired outcome is important for people in roles trying to make others mobilize action and development in their activity (Deci & Ryan, 2000). Individuals can be mobilized to act because they like the activity itself or because of external pressure to engage the activity. Such differences in starting points may have various effects on the activities outcome (Deci & Ryan, 1985).

Self-determination theory (SDT) explains that motivation for achievement behavior is driven by a desire to satisfy three basic human needs; *autonomy, competence and relatedness* (Deci & Ryan, 1985, 2000). These are fundamental psychological needs that humans strive to meet in order to achieve personal growth and psychological adjustment in various contexts. Whether or not these needs are covered, directly influences motivational quality. The need for autonomy refers to the individual's possibility for choice and participation in decision making regarding one's developmental process (Deci & Ryan, 1985, 2000). Evolvement of an autonomous personality is viewed as important to avoid behavior following maladaptive and destructive paths. Autonomous personalities are more likely to find the best solution for

personal growth and effective behavioral regulation across domains and developmental stages (Deci & Ryan, 2000). Feelings of personal competence in the activity, also affects motivation. SDT claims that human beings are curious in nature, displaying strong tendencies towards exploration. Striving for competence in this manner can be seen as a route to actualization of one's specific adaptive competences and flexible functioning to changing environmental demands. The proximal aim of competence motivation is to be as effective as possible in one's actions and the pleasure following this feeling (Deci & Ryan, 1985, 2000). Relatedness also plays an important, but yet more distal role in covering the basic needs. SDT emphasizes that human beings are naturally social and that cohering with one's group, feeling connected and cared for in addition to internalizing group norms, needs and values, seems to be an evolutionary tendency (Deci & Ryan, 2000). Practically, individuals experiencing good relationships and connecting with significant others such as; peers, coaches, teachers etc are fulfilling the need for relatedness (Deci & Ryan, 1985, 2000).

Fulfilling basic needs are thought of as important to nourish personal development. This development however will not be evident if some of the basic needs remains unfulfilled (Deci & Ryan, 2000; Ryan & Deci, 2000a). A situation where one has to neglect fulfillment of one need to attain another is considered inhibiting development of personal capacity (Ryan & Deci, 2000a; Ryan & Deci, 2000b). If an athlete have to sacrifice the need for autonomy to be able to feel related to the team or to prove his/hers competence in the eyes of a coach, such need conflicts would be provided, hence impairing individual growth (Ryan & Deci, 2000a; Ryan & Deci, 2000b).

2.3. The Motivational Continuum

2.3.1. Cognitive Evaluation Theory

A sub-theory of SDT, *Cognitive Evaluation Theory* (CET), explains specific factors that can enhance or undermine individuals' feelings of intrinsic motivation, based on whatever the circumstances permit (Deci & Ryan, 2000). Human beings tend to be naturally intrinsically motivated and engage in activities that seem appealing to them. *Intrinsic motivation* is described as a state where the person tends towards assimilation, mastery, spontaneous interest and exploration of the activity as well as

perceiving internal control (DeCharms, 1968; Deci & Ryan, 2000). CET specifies that intrinsic motivation is a result of the individuals' perception of competence and feelings of autonomy (Deci & Ryan, 2000). Feelings of competence however will not enhance intrinsic motivation, without being accompanied by a sense of autonomy. For intrinsically motivated behavior to be evident, individuals must experience the activity as self-determined in addition to a perception of personal competence. If the individual perceives the activity as controlling with diminished sense of autonomy, intrinsic motivation is likely to be undermined. In such situations feelings of being external control possibly emerges (Deci & Ryan, 2000). Research indicates that students working under caring and known teachers have the possibility of enhancing intrinsic motivation. Contradictory, working with unknown and non-caring teachers would undermine intrinsic motivation and enhance the extrinsic reasons for participation, supporting the role of individuals' feelings of relatedness (Deci & Ryan, 2000).

Intrinsically motivated behavior is said to be a prototype of self-determined motivation. The natural doing of an activity without any controlling aspects attached to it, is proposed as being intrinsically motivated. This generates an *internal perceived locus of causality*, meaning that behavior is one's own choice and self initiated (DeCharms, 1968; Deci & Ryan, 2000). The individual participates in the activity based on internal rewards, such as interest and mastery. If a behavior is influenced by any form of control, the activity is not being executed for its own sake and enjoyment. Locus of causality is now *external*, meaning something outside the activity itself initiate the individual to act (DeCharms, 1968). The participator develops an instrumental attitude towards his/hers behavior, thereby creating a shift in locus of causality. One's actions are now thought as a mean to gain a certain outcome, not being seen as an end product in itself (Deci & Ryan, 1985, 2000). This shift in locus of causality is important for development and maintenance of intrinsic motivation and is especially relevant to the common assumption of motivating by rewarding. If a reward is perceived as behavior controlling in an already intrinsically motivated activity, locus of causality alters to being seen as external and the intrinsic motives for participation are undermined (Deci & Ryan, 2000). If the person on the other hand is unexpectedly rewarded *after* a good performance, this will be perceived as informational to one's

perception of competence and would facilitate intrinsic motivation (Deci & Ryan, 2000).

2.3.2. CET – Controlling and Informational Aspect of Rewards

To enhance individuals' sense of self determination, it is important to keep in mind the way educational systems are built up and significant others behave in contexts where performance is rewarded (Deci & Ryan, 1985, 2000). Factors contributing to the initiation and regulation of human behavior may influence the way individuals perceive these regulations. Variations in how these regulations are perceived have the potential to affect motivational processes. Such factors could be; the offer of a reward, how coaches administer feedback or the imposition of a deadline (Deci & Ryan, 1985). Interpersonal communication, giving competence feedback, about how one regulates behavior will vary on behalf of the information-delivery process. An individual can perceive a message or a reward as either *controlling* or *informational* on behalf of the meaning of the reward, or the contextual placement (Deci & Ryan, 1985). If a reward is perceived as controlling, this could have a major impact in an already intrinsically motivated behavior. Feeling a potential reward controlling behavior, indicates that participation is regulated by others, thereby experienced as pressure to behave, think, feel, or act in specific patterns (Deci & Ryan, 1985). If a coach offers a reward for the team *if* they beat the opponent, this is considered as steering the players' behavior down a certain path. Such approach appeals to players' perceptions of control and the forthcoming match is now seen as an instrument to obtain the promised reward. The creation of instrumentality tends to undermine intrinsic motivation because it is not the activity itself that is considered motivating, but the contingency of the reward. Locus of causality has been altered from being internal to external (Deci & Ryan, 1985).

An informational event is characterized by the individuals' opportunity for personal choice and is not followed by any pressure from the environment (Deci & Ryan, 1985). An informational reward is assumed to be autonomy supportive and perceived as critical information for the individual on how to interact effectively with the environment (Deci & Ryan, 1985). Rewarding performances unexpectedly and *after* an accomplishment, is perceived as information regarding individual competence. The person have made an accomplishment based on his/hers own initiation, and the

environment acknowledges this autonomy and its competency as an outcome. Based on the autonomy supportive nature and feedback deriving from the individuals' competence, this is facilitative of developing intrinsic motivation (Deci & Ryan, 1985). Locus of causality remains internal and the person is still doing the activity based on self induced initiation and free choice, giving nutrition to intrinsic motivation (Deci & Ryan, 1985). An expected reward provided in an already intrinsically motivated behavior that would alter the locus of causality and diminish intrinsic motivation (Ryan & Deci, 2000a). However; the picture is not complete by differentiating these two motivational types. One must also understand how individuals carry on with extrinsically motivated activities and how motivational differences affect people's persistence, development, and well-being (Ryan & Deci, 2000a).

2.3.3. Organismic Integration Theory

As stated, not all activity engagements are intrinsically driven, in fact many participations are catalyzed by extrinsic motives (Deci & Ryan, 2000). According to SDT this nonintrinsically motivation is reflecting the degree of whether the values or regulation of the actual behavior has been *internalized* and *integrated*. Internalization refers to an individual just "taking in" a value or regulation, whereas integration refers to further adaption of that regulation until it emanates from their sense of self (Deci & Ryan, 2000).

To investigate the different forms of extrinsic motivation, another sub-theory named *Organismic Integration Theory* (OIT) is considered meaningful. This approach ranges different types of motivation from *amotivation* to *intrinsic motivation* placed on a continuum. Between the two distal ends, different types of extrinsic motivation exist; *External regulation*, *Introjected regulation*, *Identified regulation*, and *Integrated identification* (Deci & Ryan, 2000). These motivational types are ranged from higher to lower levels of self-determination. *Amotivation* is a state where the individual has no interest at all in the activity, low feelings of competence and not expecting the activity to result in a desired outcome. This is characterized by the person not being willing to act at all or acting without intent (Deci & Ryan, 2000). *External regulation* is the least autonomous form of extrinsic motivation. Such behavior is usually performed to satisfy an external demand, for the contingency of a reward or to avoid a threatening outcome

like punishment. Individuals being externally regulated usually experience feelings of control and external locus of causality. This regulation is characterized by poor adherence to the activity once the rewarding or threatening aspect attached to it is withdrawn (Deci & Ryan, 2000). *Introjected regulation* involves the individual taking part in an activity but not fully accepting it as one's own. Taking this perspective, the persons engagement often is characterized by guilt, anxiety and fear of failure accompanied by the striving for protecting or enhancing one's pride or ego (Deci & Ryan, 2000). This can be comparable to the Achievement Goal Theory's ego involvement, claiming some peoples motivation derive from the desire to beat others and showing superiority, especially with little or less effort than opponents (Deci & Ryan, 2000; Nicholls, 1989). It is also evident that this extrinsic motivational type is contingent by the individuals' self-esteem (Ryan & Deci, 2000a). Locus of causality is placed outside the self and feelings of autonomy are weak. Unlike external regulations, the adherence is more solid because of the partial internalization and the fact that this regulation is self induced. This is contradictory to external regulation where external pressure is forcing the individual to act in a certain way (Deci & Ryan, 2000). Introjected regulations are nevertheless relatively unstable taking in consideration the extrinsic motives for participation (Deci & Ryan, 2000). *Regulations through identification* come to display when individuals' consciously values a goal or regulation, in this manner the activity is accepted as important for the person. The activity has developed to be a part of one's identity and behavior is seen as more autonomous. Even though still being extrinsically motivated, behavior is expected to be better maintained and associated with higher levels of commitment and performance than other forms of extrinsic motivation (Deci & Ryan, 2000). It has been suggested that identified regulation is positively linked with feelings of self-determination among physical education students (Brunel, 1999). The most self-determined extrinsic motivation is *Integrated regulation*, sharing many similarities with intrinsic motivation (Deci & Ryan, 2000). The main difference between the two is that integrated motivation is catalyzed by doing an activity to gain a specific outcome, whereas intrinsic motivated behavior is only regulated by the individuals' enjoyment in the activity itself. This instrumentality characterizes the extrinsic motivation and is the main difference between *integrated regulations* and *intrinsic motivation* (Deci & Ryan, 2000).

To which degree an individual integrates extrinsically motivated behavior is determined by different factors. Extrinsically motivated behavior, being socially valued by significant others, emphasizes the importance of attachment and relatedness. The individuals' feeling of relatedness to significant others is important to the internalization-process, in an activity not considered typically interesting (Ryan & Deci, 2000a). One's sense of competence is also an influencing factor to whether or not a behavior is internalized. Socially valued behavior is more likely to be internalized by individuals when feeling efficacious, and mastering the actual activity (Ryan & Deci, 2000a). The last catalyzing factor regarding the process of internalization is individuals' feeling of autonomy. Feeling of relatedness and competence might not be enough to fully integrate the activity in the self. Integrating a regulation requires the individual to fully understand and accept the meaning of the activity and makes sure that this regulation fits one's goals and values (Ryan & Deci, 2000a). To nourish this process a sense of personal choice and freedom from external pressure to think or behave in a certain way needs to be evident. By supporting autonomy, individuals have the opportunity of transforming regulations into one's own and thereby make them more integrated in the self. Authors conclude that this supports the consideration of need fulfillment when facilitating the integrative process from external regulation to a more autonomous motivational form (Ryan & Deci, 2000a). The different regulations vary from the degree to which they are seen as autonomous or controlled. Difference in feelings of autonomy will influence the individual's actual behavior (Ryan & Deci, 2000a).

2.3.4. OIT – Autonomic and Controlling Behavior

One of the main issues regarding the OIT is whether the motivation of an individuals' motivation seen as autonomous or controlled and how this regulation affects motivation (Deci & Ryan, 2000). External regulation is the most controlled form for extrinsic motivation. No internalization has yet occurred and behavior is regulated by others. Individuals displaying an introjected regulation is characterized by the struggle between internal pressure and demands colliding with the person's lack of desire to perform the activity. Regulation is within the person but is still seen as relatively controlled because of the person's lack of intention to act (Deci & Ryan,

2000). Contradictory, if the person identifies with the value the activity holds this will catalyze internalization. Experiencing more ownership to the activity and lowered feelings of conflict regarding the behavior would be adaptive for perceived autonomy (Deci & Ryan, 2000). The most complete and effective form for internalization is integration. In this case, the person's behavior is completely voluntary even though one's motivation is still extrinsic. This ongoing person-environment interaction is an important regulatory process regarding individuals' perception of whether actions are carried out based on controlled or autonomous reasons (Deci & Ryan, 2000). This continuum also proves that fully integrated extrinsic motivation is not simply to be seen as intrinsic motivated behavior. Motivation remains extrinsic even though the individuals' actions are fully voluntary. The instrumental aspect attached differentiates from intrinsically motivated behavior (Deci & Ryan, 2000). Hence, intrinsic motivation or well integrated extrinsic motivation is the basis for self-determined behavior. Contradictory, feelings of being controlled or non-self-determined behavior are actions where an individual feels pressured to behave or act in certain ways. If regulations are external or introjected, this might come to display (Deci & Ryan, 2000). It is also important to remember that all regulational forms, even the most controlled, involves the person's intention and motivation to act. This differentiates from amotivation where individuals lack this intent and display a complete absence of self-determination, thereby standing in contrast to both intrinsic and extrinsic motivation (Deci & Ryan, 2000)

Behavior	Non Self-Determined			Self-Determined		
Type of Motivation	Amotivation	Extrinsic Motivation				Intrinsic Motivation
Type of Regulation	<i>Non-regulation</i>	<i>External Regulation</i>	<i>Introjected Regulation</i>	<i>Identified Regulation</i>	<i>Integrated Regulation</i>	<i>Intrinsic Regulation</i>
Locus of Causality	Impersonal	External	Somewhat External	Somewhat Internal	Internal	Internal
Relevant Regulatory Processes	Non-intentional Non-valuing Incompetence Lack of Control	Compliance External Rewards and Punishments	Self-control Ego-involved Internal Rewards and Punishment	Personal Importance Conscious Valuing	Congruence Awareness Synthesis With Self	Interest Enjoyment Inherent Satisfaction

Figure 1: The self-determination continuum, showing the motivational, self-regulatory, perceived locus of causality bases and corresponding processes of behaviors that vary in the degree to which they are self-determined (Ryan & Deci, 2000).

2.4. Intrinsic Motivation in Sports

Taking the perspective of SDT, a great amount of sport participation can be labelled as intrinsically motivated (Vallerand, Deci & Ryan, 1987). Individuals' attraction to sports can be due to experimental rewards like feelings of excitement or personal competence. This is some of the main characterizations of intrinsic motivation. For intrinsic motivation to be evident, the activity has to be interesting, provide optimal challenge, involve feedback, personal experimenting and being perceived as self-induced (DeCharms, 1968). The sport context is considered to contain these elements. However, a number of extrinsic elements are also attached to sport participation (Vallerand et al., 1987). Extrinsic motives for athletic participation might be connected to rewards based on accomplishments, getting paid for athletic performances, or being exposed in media. Doing sport in order to prove one's self-worth or enhance one's social status might also be extrinsic motives for participating in sports.

Vallerand and colleagues (1987) have emphasized factors contributing positively to intrinsic motivation and facilitating self-determined motivation. *External events* like

price money or rewards tend to diminish intrinsic motivation. An activity once being performed for enjoyment's sake are now being perceived as a controlling factor of one's behavior. When individuals have a shift from internal to external locus of causality, intrinsic motivation is influenced, making behavior less self-determined. In cases where extrinsic incentive fails to attract, the athlete may no longer find the activity enjoyable and decide to drop out.

Another affecting source to intrinsic motivation is *Interpersonal Contexts*. This aspect addresses how the athletic system or significant others influence athletes' perceptions of what to consider important when participating in sports (Vallerand et al., 1987). If athletes perceive their environment as controlling with extensive focus on winning and beating others, rather than developmental processes, this might lead to a decrease in intrinsic motivation. An autonomy supportive environment, focusing on development of individuals' capacity, is said to be a facilitator for intrinsic motivation, perceived competence, and self-esteem (Vallerand et al., 1987). A relationship between a mastery climate, autonomy support, and relatedness with reference to the athletes' subjective vitality has been found among student athletes (Reinboth & Duda, 2006). These findings add to the body of knowledge regarding the adaptive nature of satisfying basic needs, emphasizing interpersonal contexts as supporting autonomous behavior, and creating a task involved environment (Reinboth & Duda, 2006). The importance of the social environment being perceived as autonomy and socially supportive, focusing on personal improvement and effort has also been highlighted (Reinboth, Duda & Ntoumanis, 2004). Giving nutrition to basic psychological needs would foster more well-being among adolescent athletes (Reinboth et al., 2004). Lately it has been provided further support to the assumption that autonomy supportive coaching predicted autonomous goal striving (Smith, Ntoumanis & Duda, 2007). Autonomous motives were positively related to regulation of effort toward one's goals, whereas effort related positively to personal goal attainment. Goal attainment was meaningfully linked to both need-fulfilment and well-being (Smith et al., 2007).

Internal Events refer to the individuals' thoughts and feelings and how these cognitions possibly control behavior (Vallerand et al., 1987). Thought and feel-based processes can indeed lead to lowered self-determined motivation if one senses a pressure towards training or participating in sport. The individuals' state of involvement

is to play a relevant role in this process. If athletes are ego involved a greater risk of feeling pressured and fear of losing evolves, when compared to a task involved athletes (Nicholls, 1989; Vallerand et al., 1987).

Verbal feedback is another influential source on intrinsic motivation. Positive verbal feedback increases intrinsic motivation, whereas negative feedback is more likely to decrease intrinsically motivated behavior (Vallerand et al., 1987). Approaching regulation of intrinsic motivation from this basis refers to athletes' perceived competence. If athletes receive positive reinforcement from their coach this could possibly increase perceived competence and thereby function as a mediator for an increase in intrinsic motivation (Vallerand et al., 1987). Coaches supporting athletes' sense of autonomy have also been proven effective in facilitating intrinsic motivation in practical research (Vallerand & Losier, 1999). Adaptive outcomes like a decrease in dropout rate, an increase in training effort, and importantly also an increase in actual swimming performance has been reported (Vallerand & Losier, 1999). Dropout rate decreased from 35% to 4,5%, 20 out of 22 swimmers developed their personal standards to a national level, whereas 4 was selected to represent the national team. This provides indications of the adaptive outcome of facilitating intrinsic motivation in a group of athletes, by giving nutrition to both increased persistence and performance enhancement (Vallerand & Losier, 1999).

Coaches designing an autonomy-supportive climate among top level athletes also revealed a positive relationship between supporting basic needs and performance (Mallett, 2005). By coaching in an autonomy-supportive way, the Australian track relay teams improved their personal standards during the Olympic Games in Athens. This practical study encouraged sport psychologists and coaches to implement a more autonomy-supportive coaching style to help athletes reach peak performance by giving nutrition to basic needs (Mallett, 2005).

According to CET, the common assumption of rewards being a catalyst of athletes performing their best, fails to be true (Vallerand et al., 1987). Whether the reward is perceived as controlling or informational would influence motivational quality. Rewards such as price money if attaining a specific result, is seen as controlling in the way it directs one's behavior. Diminished self-determined motivation and a decrease in intrinsic motivation are an expected result. A reward is seen as

informational if an individual does not perceive it as behavior-controlling, often characterized by an unexpected reward for good performance or effort. The athlete finds this reward motivating because of its appeal to perception of competence, without directing behavior. In this manner rewards can be facilitative for intrinsic motivation (Vallerand et al., 1987). Interestingly, footballers on scholarship reports lower score on intrinsic motivation than footballers not on a scholarship. In this case the locus of causality is altered from internal to external and their participation is perceived as controlled (Vallerand et al., 1987). It is suggested that athletes training for autonomous reasons and feeling supported by both coach and parents, can prevent developing injuries and burnout (Gagnè, Ryan & Bergmann, 2003). The need for longitudinal research investigating this hypothesis has been pronounced (Gagnè et al., 2003). Studies have also provided evidence to the notion that different coaching-styles have various outcomes in regard to both basic needs and intrinsic motivation among athletes in different sports (Hollembek & Amorose, 2005). Athletes' reports of a democratic coaching style had positive relations to basic need fulfilment. Fulfilment of basic needs was meaningfully linked with intrinsic motivation (Hollembek & Amorose, 2005).

Trying to motivate individuals by controlling their behavior, not giving opportunity for choice, setting up rewards in already intrinsically motivated activities, giving negative feedback and focusing on winning, can be contributing factors to a decrease need-fulfilment (Deci & Ryan, 2000; Vallerand et al., 1987). Low sense of self-determined motivation can lead to diminished intrinsic motivation and steering individuals' motivation towards more extrinsic reasons for participation – even towards amotivation. The most maladaptive motivational outcome is amotivation. In this case the individual displays no will or intention to act (Deci & Ryan, 2000). Studies within physical education have pointed out that amotivation presents a strong connection to a low sense of autonomy support and perceived competence (Ommundsen & Kvalø, 2007). Negative effects of controlled motivation is also supported in studies showing low feelings of autonomy-support from coaches and parents, leading to a more unstable and fragile self-esteem within physical activity (Gagnè et al., 2003). Instability and lowered feelings of vitality has also been linked to athletes' perceptions of external regulations and amotivation (Gagnè et al., 2003). Thwarting individuals' basic needs can indeed develop negative outcomes. Doing sports for the wrong motives, drop out,

decreased intrinsic motivation and regulations moving towards amotivation are all negative consequences one might experience when suppressing needs for autonomy, competence and relatedness (Deci & Ryan, 2000) Non-optimal functioning like increased anxiety, grief and hostility are more likely to develop when the innate needs remains unfulfilled (Ryan & Deci, 2000b). Thwarting basic needs can possibly lead to changes in general well being and individuals responding by developing maladaptive behavioral manifestations. Interpersonal contexts like evaluative teachers and over-challenging coaches have been linked to support or thwarting of basic needs (Ryan & Deci, 2000b). Contemporary research has also pointed out a meaningful relationship between lower levels of self-determined motivation and maladaptive outcomes such as overtraining and burnout in elite athletes of all ages (Cresswell & Eklund, 2005; Lemyre et al., 2007; Lemyre et al., 2006).

2.5. Burnout

Based on empirical burnout research among health care workers, the process of burnout has been described as multidimensional (Maslach & Jackson, 1984). Burnout has been defined as a syndrome with dimensions regarding emotional exhaustion, depersonalization and reduced accomplishment. This occurs among individual working with other people in some capacity (Maslach & Jackson, 1984). This definition of burnout has been transferred into the sport context (Raedeke, 1997). Modifications were made to adjust for the contextual differences between health care workers and athletes. It was pointed out that the core element of sport for athletes` was performance. According to this, the athlete`s burnout definition should fit the relation to *sport performance* (Raedeke, 1997). Based on this contextual modification, athlete burnout is described as a syndrome of “*physical and emotional exhaustion, sport devaluation, and reduced sense of accomplishment*” (Raedeke, p. 398, 1997). Athletes presumably participate in sports for two reasons; *entrapment* or *enjoyment* (Raedeke, 1997). Feelings of entrapment are proven to be closer linked to burnout development than feelings of enjoyment. Individuals perceiving the role of being an athlete as locked or entrapping are more likely to be burnout candidates. Meaning, if participation is not willingly, but characterized by a feeling of having to continue the involvement, this could be a catalyst for developing burnout (Raedeke, 1997). Assumingly burnout

though being a multidimensional process has a major motivational dimension to it (Gould, 1996). Burnout was suggested to be “motivation gone awry” based on the fact that athletes leave an activity they once enjoyed (Gould, 1996). An “at-risk” perfectionist personality, making athletes vulnerable to burnout, has also been suggested (Gould et al., 1996a). With the basis from Raedeke’s definition of athlete burnout, a measurement tool for examining the research area was developed. “Athlete Burnout Questionnaire” has proven subscales correlating positively with stress, trait anxiety, amotivation and negatively with coping, social support, enjoyment, commitment and intrinsic motivational indices (Raedeke & Smith, 2001). This supports the assumption that athlete burnout involves a motivational aspect (Raedeke & Smith, 2001).

Analysis of training stress and burnout propensity among competitive athletes, have also contributed to understanding athlete burnout as a syndrome (Silva, 1990). Training stress is necessary for gain in performance and athletes possibly have a positive or negative adaption to this stressor. Positive reactions to training stressors make the organism adapt, and performance improves. This performance gain is only temporary and to maintain this increased level of performance the stimuli must be reimposed at approximately the same or even at a higher level (Silva, 1990). If an athlete responds negatively to training stressors, a negative training continuum reveals. The initial state of negative training stress is staleness. Staleness is defined as an anticipated by-product of athletic training expected to occur in heavy periods of training and during the competitive season. It is characterized as a period of time where body and mind attempt to adapt to imposed demands that are greater than current capability. This cycle often reflects no training gain or even a drop in performance (Silva, 1990). If an athlete train through a phase of staleness, failing to listen to physiological as well as psychological signs, overtraining might develop. When there is a repetitive failure of the body’s adaptive mechanism to cope with the chronic training stress, one can label it; overtraining (Silva, 1990). This part of the training continuum is a more severe condition than staleness, resulting in detectable psycho-physiological malfunctions and is easily observable due to changes of the athletes’ mental state and athletic performance. Overtraining is not a desirable training stress outcome. Even though this state induces bodily malfunctions, several athletes tend to respond with increased training load. Athletes regressing beyond the state of overtraining elevate the potential

for developing burnout symptoms. Burnout ends the continuum via staleness to overtraining and is the least desirable outcome from excessive training stress (Silva, 1990). This maladaptive state is defined as an exhaustive psycho-physiological response exhibited as a result of frequent, extreme and generally ineffective efforts to meet the growing training and competitive demands placed on an athlete (Silva, 1990). Burnout is distinct from staleness and overtraining because individuals experiencing this face often drop out from the activity, voluntary or involuntary. The body's response system is exhausted both physically and mentally, the athlete often experiences reduced personal accomplishment, severe loss of self-esteem, and boredom in the activity (Silva, 1990). Severe practice conditions followed by extreme physical exhaustion combined with little time to recover from competitive stress, is labeled as influential factors associated with burnout development (Silva, 1990). Reports of self-esteem loss and boredom (Silva, 1990) additional to the relationship with stress, anxiety, coping, social support, commitment, amotivation, and intrinsic motivation (Raedeke & Smith, 2001), suggest a relationship between athlete burnout, and motivation.

2.5.1. Burnout and Motivation

Several studies have pointed out a meaningful relationship between athlete burnout propensity and motivational aspects (Gould, 1996; Gustafsson, Kenttä, Hassmén & Lundquist, 2007; Lemyre et al., 2007; Raedeke, 1997). Burnout research taking a social-cognitive perspective has revealed that motivational dispositions, perceptions of motivational climate, perceived ability, and dimensions of perfectionism are closely linked to symptoms of burnout in elite athletes (Lemyre, Hall, & Roberts., 2008). Based on different motivational profiles, results at the end of the season yielded distinct differences on signs of athlete burnout (Lemyre et al., 2008). The following conclusion pointed out a relationship between a maladaptive motivational profile and athletes' perception of being controlled. In combination with low goal attainment this might contribute to the athletes' feelings of entrapment in the sport context. Feelings of entrapment are often followed by lowered intrinsic motivation; where ego orientation, perception of a performance oriented climate, and dimensions of perfectionism is known to be major contributors (Lemyre et al., 2008). Contradictory to the belief that individual displaying a high task/high ego motivational profile, task orientation would

mediate maladaptive beliefs exhibited by ego orientation (Roberts, 2001). Motivational profiles where a high task orientation remained, whereas ego orientation was suppressed displayed low signs of burnout. If both goal orientations were moderate to high, there was a greater risk of elevated burnout scores (Lemyre et al., 2008). This finding can be explained by the dimensions of perfectionism that may evoke athletes' concern about mistakes, and constant striving for errorless performances (Lemyre et al., 2008). This indicates that the burnout syndrome is not simply "motivation gone awry", as stated by Gould (1996), but more likely a consequence of an underlying maladaptive motivational profile (Lemyre et al., 2008).

Meaningful relationships between different levels of self-determined motivation, autonomy support, and signs of burnout in elite swimmers have also been established. A decline in motivational quality throughout the season increased possibility for athlete burnout at the end of the season (Lemyre et al., 2006). Authors suggested that monitoring athletes' motivational quality and feelings of self-determination in their actions was potentially helpful in the attempt of steering athletes' clear of maladaptive outcomes such as burnout (Lemyre et al., 2006). An argument to this conclusion is athletes' maladaptive response when being fuelled by external regulations in their athletic participation. Potentially, this influences them to follow training plans without questioning or adjusting them according to personal needs and developments. Consequently athletes' feelings of autonomy are suppressed and further training adaptation is inhibited (Lemyre et al., 2006).

It has also been established that self-determined motivation and overtraining have their own unique contribution to athlete burnout. This was based on the fact that high levels of self-determined motivation did not function as a moderator for reports of overtraining in burnout development (Lemyre et al., 2007). Findings from the Olympic team athletes indicated a much clearer relationship between overtraining and burnout symptoms than did the group of junior elite athletes. Additionally, level of self-determined motivation was more evident in burnout development among juniors compared to Olympic athletes (Lemyre et al., 2007). A relationship between self-determined motivation at the beginning of the season and signs of burnout at season's end, clearly emerged in the group overall, supporting this approach to burnout research. Authors concluded it not being the motivation per se, but the *quality* of athletes'

motivation one must consider important in development of athlete burnout (Lemyre et al., 2007).

A study on rugby players` changes in motivation and burnout symptoms also supports a motivational approach to burnout research (Cresswell & Eklund, 2005). Seasonal variation in the key characteristics of burnout has been found, highlighting the importance of athletes` sport participation based on the right motivational indices. A “wrong” motivational profile may easier lead to burnout than adaptive participation motives (Cresswell & Eklund, 2005). A recent study in the rugby population added knowledge to the assumption that there is a close link between self-determined motivation and burnout (Hodge et al., 2008). It was concluded that thwarting the needs for autonomy and competence, emerged as a significant contributing factor for the athletes labelled as “high burnouts”. As hypothesized, players reporting high burnout scores clearly had lower reports of need fulfillment compared to “low burnout” players (Hogde et al., 2008). Following conclusion emphasized relatedness playing a more distal role in burnout development; however this relationship can be generalized to this specific group of athletes only. Factors like, age, competition level, gender, and different sports, must be taken into consideration to fully understand in the different needs fulfillment influence on burnout (Hodge et al., 2008). An additional finding was that one of the burnout dimensions; physical and mental exhaustion did not relate significantly to need-fulfillment. It is not clear why this relationship did not emerge, although it was speculated that this burnout dimension contains a physiological factor one needs to be aware of (Hodge et al., 2008). Examination of both physiological as well as psychological factors to gain more knowledge on need-covering and the different dimensions of burnout was suggested (Hodge et al., 2008).

It has also been proposed that other factors besides training load must be considered when explaining athlete burnout (Gustafsson et al., 2007). The assumption of burnout to be more common in individual sports than in team sports have not been supported, pointing out the complexity of the burnout process. 980 Swedish adolescent athletes from various sports, both individual and team, investigated the prevalence of burnout. Based on their answers, it was accounted a prevalence ranging from 1-9%, with small differences among male/female or individual/team sport (Gustafsson et al., 2007). Qualitative research also emphasizes the importance of motivational factors in

developing burnout (Gustafsson, Hassmén, Kenttä & Johansson, 2008). Initially high motivation is common among burned-out athletes. Motivation tends to disappear as the burnout experience develops. Athletes described a shift in motivation from intrinsic to becoming more extrinsically motivated, resulting in amotivation at the end. Additionally, nine of 10 athletes described having mainly ego oriented goals during the period before burning out (Gustafsson et al., 2008). An ego oriented goal orientation catalyzed the burned-out athletes' motivational loss, by not being able to beat others and not coping well with the fact that other athletes outperformed them. This supports the possible maladaptiveness of an ego oriented goal orientation when ability is low (Gustafsson et al., 2008).

The link between motivational constructs and development of burnout has also been evident in a population of tennis players (Gould et al., 1996a). By assigning two groups; one burnout and one comparison, based on burnout-scores, possible differences among the two was investigated. Burned-out players reported less input to training than did the comparison group. Low perceived autonomy is expected to lead to maladaptive outcomes like decreased intrinsic motivation and induce increased feelings of stress and frustration (Gould et al., 1996a). Further investigation also revealed that burned-out players to be lower in extrinsic motivation and higher in amotivation, suggesting that burned-out players are more likely to be motivationally withdrawn than athletes' not experiencing burnout. Authors concluded that stress-induced burnout appealingly had a clear link to motivational processes as an underlying construct (Gould et al., 1996a). A further qualitative study was carried out on 10 players identified as "the most burned out" (Gould, Tuffey, Udry & Loehr, 1996b). Players reported lack of tennis being fun to do was a major contributor in their burnout development (Gould et al., 1996b). Motivational loss was also highlighted as a factor, even though some athletes named this as a change of interest, wanting to try other activities (Gould et al., 1996b).

Findings taken from three case-studies emphasized the need to understand each burnout case individually (Gould, Tuffey, Udry & Loehr, 1997). Inappropriate goals, self-induced perfectionism, and triggers from significant others must be considered contributively factors in the complexity of burnout development. The fact that athletes reported high initial motivation developing towards motivational loss and burnout (Gustafsson et al., 2008), and the altering from perceiving sport as fun to experiencing

burnout and losing motivation (Gould et al., 1996b) shows a dynamic nature of the burnout process, and possible changes over time spans.

2.5.2. Changes in Burnout Symptoms

The need for longitudinal designs in burnout research has been pointed out by several authors to be able to identify the developmental factors and the variations in burnout signs over time (Gould, 1996; Gustafsson et al., 2007; Lemyre et al., 2007). A study conducted with top level swimmers examining their degree of self-determined motivation and symptoms of burnout over the course of a season, revealed that a shift in motivational quality from intrinsic to more extrinsic reasons can predict burnout at the end of the season (Lemyre et al., 2006). When taking part in sports for more extrinsic reasons, athletes tend to follow training plans uncritically. Loss of autonomy may inhibit the athletes' critical sense both to bodily signs and necessary changes of training plans. Participating for the "wrong" reasons evokes a greater risk of exposure to overtraining and athlete burnout (Lemyre et al., 2006). This supports the multidimensionality of the burnout process and points out that a shift in motivational and burnout symptoms tend to occur over the course of a season (Lemyre et al., 2006). Variations in burnout symptoms related to self-determined motivation during a 12-week league tournament in rugby has also been evident (Cresswell & Eklund, 2005). Athletes displaying high self-determined motivation (intrinsic motivation) were negatively associated with burnout, whereas athletes low in self-determined motivation were (amotivation) associated positively with burnout. A clear relationship between different extrinsic motivational types (external, introjected and identified regulation) and burnout did not emerge, even when taken together as a single component (Cresswell & Eklund, 2005). Seemingly the relationship between athlete burnout and distal ends of the motivational continuum (intrinsic and amotivation) are more evident than the extrinsic forms of motivation. Authors also pointed out that low scores on sport devaluation and exhaustion may be explained due to the short time span of the study. Longer periods of examination were proposed to widen the insight on the burnout phenomenon (Cresswell & Eklund, 2005). To further investigate the dynamic nature of burnout over the course of a competitive rugby season, key symptoms were measured three times during a 30-week competitive period (Cresswell & Eklund, 2006). Reduced sense of

accomplishment served as the most varying factor from pre to in-competitive phase. Changes in exhaustion were linked to playing positions and are not to be viewed as a general mediator in this population. Concluding remarks indicate that burnout is a dynamic experience with multidimensional contributors to its development, encouraging continued multidimensional research for investigating burnout from a more solid perspective (Cresswell & Eklund, 2006). Qualitative interviews with professional rugby players revealed factors such as; cumulative demands of training, and competition during a season, lack of sufficient recovery, pressure from coaches, and media. Additionally, negative reactions towards not being in the starting line, had contributing relations to the burnout process (Cresswell & Eklund, 2007).

Qualitative interviews with three cross-country skiers who left their sport due to burnout experiences, revealed excessive training with moderate to high intensity, unidimensional athlete identity and achievement strivings to validate their self-esteem as important contributors to the development of burnout (Gustafsson et al., 2007). As other studies have pinpointed, lack of recovery both physical and mentally, is a factor to consider in the process of burning out (Cresswell & Eklund, 2007; Gustafsson et al., 2007). Further support to the assumption in that athlete burnout is a dynamic and multidimensional process, with seasonal variations, based on varying contexts, motivational and physiological factors was again provided (Gustafsson et al., 2007).

Proposed early signs of burnout, measured in midseason, have recently been associated with characteristics of burnout measured at season's end among rugby players (Cresswell, 2008). Athletes' perception of rugby and money hassles, in addition to the perception of insufficient social support contributed to athlete burnout development. The author concludes that helping athletes cope with their hassles and providing enough social support might help them steer away from burning out during the season (Cresswell, 2008).

Athletes that are being exposed to large training volume on moderate to high intensity, combined with a clear lack of recovery, is an additional explanation of burnout propensity (Cresswell & Eklund, 2007; Gustafsson et al., 2007). These findings suggest the consideration of how training processes are planned and executed, when investigating athlete burnout.

2.5.3. Burnout and Training

Based on training logs from top international skiers, it has been suggested a total training duration of 1000 hours a year (Rusko, 2003). This is also supported by the theory of deliberate practice, which proposes 10 000 hours of training to be required for reaching top performances at an elite level (Ericsson, Krampe, & Tesch Römer, 1993). These indications indicate that a considerable training load is needed to develop international standards and the importance of being able to handle high training loads, as well as steering away from maladaptive training outcomes (Rusko, 2003). Elite athletes are described as being able to endure hard and exhaustive training, tolerating pain and pushing themselves as far as they possibly can (Jones et al., 2007).

The common statement is that burnout is considered a multidimensional process (Cresswell & Eklund, 2006; Gould, 1996; Lemyre et al., 2006; Raedeke, 1997). Based on this assumption, it is suggested that negative adaptation to training can be a contributing factor to athlete burnout (Kenttä & Hassmèn, 1998). Positive overtraining is appraised as a desirable outcome with physiological adaptation and super-compensation, improving athletes' capacity. The other side of the coin is the effect following negative overtraining. This undesirable training outcome possibly causes maladaptation with negative consequences such as development of staleness (Kenttä & Hassmèn, 1998). This process involves factors such as; physiological, psychological, biochemical, and immunological symptoms. It is also emphasised that psychological monitoring may reveal early warning-signs of staleness easier than physiological and immunological markers (Kenttä & Hassmèn, 1998). Importantly one needs to differentiate between stale and a burned-out athlete. Absence of motivation is a key characteristic of burnout, while a stale athlete might still be motivated to train – perhaps even harder than before to compensate for the decrease in performance (Raglin, 1993). It was also concluded that it might not be the excessive training per se, but the lack of sufficient recovery causing negative overtraining and staleness (Kenttä & Hassmèn, 1998). An athlete failing to recover within 72 hours is presumably negatively overtrained, transiting into an overreached state. Athletes would probably benefit from monitoring quality of training-recovery in addition to monitoring training hours and intensity. Such approach provides better balance in athletes' training-recovery continuum (Kenttä & Hassmèn, 1998). The training continuum must also be linked to

motivation. A highly motivated athlete might respond to a plateau or decrease in performance with an increased training load, often followed by a further decrease in performance capacity (Kenttä & Hassmèn, 1998). This is in line with Raglins (1993) differentiation between a stale and a burned-out athlete and is a part of the overtraining-burnout continuum (Kenttä & Hassmèn, 1998; Raglin, 1993). The overtraining/burnout syndrome share symptoms as poorer performance, severe fatigue, muscle soreness, overuse injuries, reduced appetite, disturbed sleep patterns, mood disturbances, immune system deficits, and difficulties to concentrate. Even though sharing symptoms, a clear distinction can be made; a burned-out athlete also lacks motivation whereas a overreached/stale athlete still finds training and achievement strivings motivating (Kenttä & Hassmèn, 1998; Raglin, 1993) By studying Winter Olympians and junior athletes in the development of burnout, further support was added to the assumption that motivational parameters as well as overtraining has unique contribution to athlete burnout (Lemyre et al., 2007). It was demonstrated a meaningful relationship between symptoms of overtraining and dimensions of athlete burnout (Lemyre et al., 2007). This relationship however was not as distinct among the junior athletes when comparing to the Winter Olympians. Among the senior athletes, a clear relationship between symptoms of overtraining and signs of burnout emerged, indicating overtraining being a precursor of an athlete burning out (Lemyre et al., 2007). Interviews with burned out athletes also revealed excessive training stress as a catalyzing factor (Gustafsson et al., 2007). These athletes did not train too much per se, but had a high volume and percentage of their training was executed at a moderate to high intensity, spending 19-34 % of their total training at high to very high intensity. Additionally, reports of insufficient recovery served as a contributing factor to their burnout experience (Gustafsson et al., 2007). Under-recovery was mentioned by Kenttä & Hassmèn (1998) to be an important contributor to the overtraining syndrome, often catalyzed by a negative training adaption, making athletes train even harder due to the decline in performance.

Based on the assumption of athlete burnout being a multidimensional syndrome research have provided a clear relationship between self-determined motivation, symptoms of overtraining, and athlete burnout (Cresswell & Eklund, 2007; Gustafsson

et al., 2007; Lemyre et al., 2007). This theoretical basis suggests these factors being interconnected and catalyzing the development of athlete burnout.

3.0 Aim of study

A previous study has through a cross-sectional design, proven a meaningful relationship between self-determined motivation in the start of season, symptoms of overtraining and burnout (Lemyre et al., 2007). This study's aim is to assess how these variables evolve in relation to each other over the course of a competitive season for elite cross-country skiers. Possible findings might be used as a tool for coaches, leaders, and athletes in help of understanding how seasonal variations in motivation and symptoms of overtraining possibly impact burnout propensity.

3.1. Hypotheses

Based on the assumption that self-determined motivation is meaningfully associated with burnout propensity during the course of a season:

It is hypothesised that:

1. Higher levels of self-determined motivation are negatively linked to burnout throughout the season, while:
2. Lower levels of self-determined motivation are positively linked to burnout throughout the season

Additionally, it is hypothesized that throughout the season;

3. Overtraining symptoms are positively associated to signs of burnout

4.0 Method

In order to monitor motivational changes, this study uses a *longitudinal* design. Following a group of athletes' development over a period of time. Approaches using longitudinal designs have been suggested by researchers within the field of burnout (Gould, 1996; Gustafsson et al., 2007; Lemyre et al., 2007). This methodology is considered powerful due to the ability of surveying changes over time.

Questionnaires have previously been tested for validity, reliability and internal consistency. Translated versions of the questionnaires have previously been used in Norwegian speaking populations (Lemyre et al., 2007).

To support and investigate possible trends in seasonal variables, in addition to gaining further insight on the forestalled hypothesis, case studies will be presented (Black, 1999). Plotting graphs on the basis of parameters from the chosen population is commonly used in science, being supportive of case studies to investigate realistic situations. This approach might be considered as an interpretive study, making an effort to describe as well as conceptualizing the information and connecting this to theoretical assumptions (Thomas, Nelson & Silverman, 2005). Case presentations of self-determined motivational subscales are presented on basis of self-determination indexes.

4.1. Participants and Procedures

Male and female cross country skiers competing at the elite level ($n = 36$) were invited to participate in the study. In the early stages of the investigation the manager of the Norwegian cross-country (x-c) team was contacted to receive permission to implement the study and to obtain contact information of respective head coaches. These were contacted and informed by phone and email, with a copy of the projects descriptions approved by the Ethical Committee of Norway (Appendix A). E-mails with statement of approval together with information of the study (Appendix B), was sent to the participants ($n = 36$) at T 1. It was clearly communicated through this information package that participation was totally voluntary. Participants was informed that they were free to withdraw from the study at any given time point. Questionnaires (Appendix C) were distributed by mail, pre-addressed and pre-stamped, in addition to a web based questionnaire; Questback. To minimize errors regarding answering the questionnaires, a description was sent both by mail and email. The Questback account was opened for

answering with an answering window set to approximately 4 weeks. The prolonged answering window was due to athletes` summer vacation. Respective coaches were also informed about the start of the data collection. A total of 23 participants responded at T 1.

T 2 was opened with a 14 days answering window. 19 participants answered.

T 3 started immediately after the national junior championship. Some of the participants ($n = 5$) were approached a week later, because of their participation in the World Championship in Liberec. The answering window was set to 20 days after distribution. This prolonged answering window was set due to vacations after the end of the season. A total of 18 participants responded. Further details regarding data collection are provided in Figure 2.

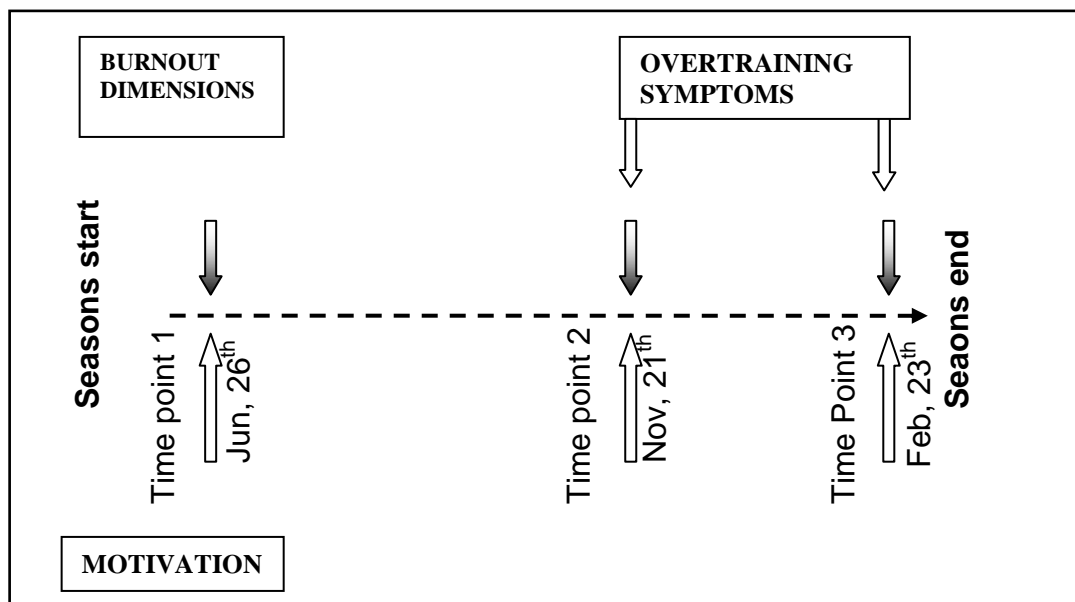


Figure 2: Data collection schedule for self-determined motivation, burnout and overtraining

Participants ($n = 13$) having completed all three data collections served as the final population to investigate the current hypotheses. A total of 35 % from the chosen population was then represented. Drop-out rate from the original data-collection was 44 %, when comparing with the group completing all data-collections. From this material statistical analyses was conducted to provide oversight in overall variations in variables according to forestalled hypotheses. Individual cases reflecting the hypotheses are also presented and discussed. Notably the excluded participants did not differ significantly from the included group on any of the chosen variables. Participants were 5 male and 8

female ($M = 18.61$ $SD = 1.19$) with world cup as competitive level mode, athletes reported having participated in organized sports from 10-11 years and training 600-700 hours per year.

4.2. Statistical Analyses

All statistical analyses were executed using Microsoft Excel in addition to Statistical Package for Social Science 15.0 (SPSS). Shapiro-Wilks` test of normality revealed that six of the nine included subscales differed significantly from the normality distribution. Calculations of skewness and kurtosis also suggested a non-parametric distribution. Further analysis was conducted using non-parametric statistical tests. To control for the making of Type I error, a level of probability was set to $P < 0.05$. This Alpha level is widely accepted in scientific research to prevent a rejection of the null hypothesis when the null hypothesis is true (Thomas et al., 2005).

Spearman`s Rho was selected as statistical test for correlation. Calculations of effect size, as well as computing the graphics were conducted using Microsoft Excel. Testing differences in variables at different time points was carried out using Wilcoxon`s signed-rank test and Cohen`s d , to determine significant changes and effect size of the possible variation. To determine correlation coefficients, scores above 0.30 will be deemed satisfactory for further discussion.

The calculation formula of effect size being used was; $M_1 - M_2 / SD_1$. The standard deviation from T 1 was used as a denominator to follow guidelines of measuring time series with a clear starting point (Looney, Feltz, & VanVleet, 1994; Thomas et al., 2005). This formula has previously been used for determining changes over time (Kazis, Anderson & Meenan, 1988). For behavioral science it has been suggested that 0.2 or less is a small ES, about 0.5 a moderate ES, and 0.8 or more is considered as a large ES (Thomas et al., 2005; Vincent, 2005).

4.3. Cronbach`s α

Chronbach`s coefficient α is an indicator of internal consistency of scales with no right or wrong answers (Black, 1999; Thomas et al., 2005).

Taking in consideration the small sample size, Chronbach`s α level has been set to a .50 level to be accepted. All subscales below this criterion was excluded from the

analyses. This is below Nunnally and Bernstein's (1994) proposed .70 criterion. There is also strong conceptual support, in addition to these questionnaires being previously used in similar Norwegian elite athlete populations yielding adequate reliability coefficients.

4.4. Questionnaires

Alpha levels at the different time points (T 1, T 2 and T 3) are presented within a parenthesis and excluded items and subscales at each time point are commented.

Questionnaires are presented in Appendix C.

4.4.1. Situational Motivation Scale (SIMS)

Measurement of self-determined motivation was conducted by the Situational Motivation Scale (SIMS). This questionnaire was designed to measure Intrinsic Motivation, Identified Regulation, External Regulation and Amotivation (Guay, Vallerand & Blanchard, 2000). The scale consists of 16 questions, measuring 4 factors on each of the motivational regulations (Guay et al., 2000). The main question "*Why are you currently engaged in cross country skiing?*" with under questions like "*because cross country is fun*", to detect the different regulations. Responses are provided on a 7-point Likert scale, ranging from (1) "*does not correspond at all*" to (7) "*corresponds exactly*" (Guay et al., 2000). A self-determination index (SDI), indicating relative autonomy was calculated. SDI integrates scores on each motivation subscale into a single score corresponding to the participant's position on the self-determination continuum. Following formula is used: $(2 * \text{Intrinsic motivation} + 1 * \text{Identified regulation}) - (1 * \text{External regulation})$. A similar formula has been used in previous burnout research (Lemyre et al., 2007; Lemyre et al., 2006). Amotivation is left out from the formula in the current study. This approach reduces the number of variables in the analyses. A pattern for relationship emerged on all three time points. Subscales lying close to each other on the self-determination continuum (e.g. intrinsic motivation and identified regulation) were more strongly correlated than the distant ones (e.g. intrinsic motivation and external regulation).

4.4.2. Athlete Burnout Questionnaire (ABQ)

For the measuring signs of burnout; "Athlete Burnout Questionnaire" (ABQ) was used. This questionnaire was developed by Raedeke and Smith (2001) based on the definition of burnout, and qualitative interviews in the research done in burnout among health care workers (Maslach & Jackson, 1981). The questionnaire contains 16 items, measuring the three key dimensions of athlete burnout; 1: Reduced Sense of Accomplishment; 2: Emotional and Physical Exhaustion; 3: Devaluation of Sport Participation. The stem for each question is "How often do you feel this way"? Answers are provided in a 5-point scale anchored by (1) *almost never* and (5) *almost always*. A total summed score for the ABQ is achieved when averaging all three subscale scores. For the current study a Norwegian version of the ABQ is used (Lemyre et al., 2007). Emotional and Physical Exhaustion alphas` ranged; (.77; .87; .74). One item was removed on both T 1 and T 2. Reduced Sense of Accomplishments alphas` ranged; (.75; .85; .89). Two items were removed from the subscale on all three time points. Sport Devaluation alphas` ranged; (.69; .74; .84). One item was removed on T 1. Total Burnouts alphas` ranged; (.84; .91; .86). The items removed from the subscales; Exhaustion, Accomplishment and Devaluation, were not included in calculations of Total Burnout.

4.4.3. Short Overtraining Symptoms Questionnaire (SOSQ)

This questionnaire was developed to detect elite athletes suffering from symptoms of overtraining (Lemyre et al., 2007). Questions have been adapted to fit overtraining symptoms, grounded in research based evidence (Lemyre et al., 2007). The stem of the questions is: "Express how you have felt lately". Responses is provided on a 10-point Likert scale ranging from (1) "*very bad*", to (10) "*very good*" (Lemyre et al., 2007). The items are provided on symptoms regarding overtraining, like; (1) sleep quality; (2) appetite; (3) energy; (4) training desire; (5) training quality. Additional questions addressing issues regarding illness or overuse injury was included in the questionnaire (Lemyre et al., 2007). Satisfying internal consistency has been proven in previous research on elite athletes (Lemyre et al., 2007). Overtraining alphas` ranged; (.77; .70). One item was removed at T 2.

5.0 Results

5.1. Analyses seasonal variations

5.1.1. Descriptive statistics

Table 1: Descriptive statistics for self-motivation, burnout and overtraining ($n = 13$)

Variables	T 1 (M/SD)		T 2 (M/SD)		T 3 (M/SD)		Score
Intrinsic Motivation	5.87	0.67	6.07	0.86	5.90	0.92	1 to 7
Identified Regulation	5.87	0.68	5.83	0.81	5.98	1.00	1 to 7
External Regulation	2.06	1.06	1.96	0.76	2.02	0.89	1 to 7
Amotivation	1.29	0.58	1.38	0.55	1.23	0.37	1 to 7
Self-determination index	15.54	2.13	16.02	2.50	15.77	2.30	- 18 to 18
Exhaustion	1.63	0.52	1.71	0.71	2.06	0.47	1 to 5
Devaluation	1.79	0.66	1.73	0.64	1.78	0.74	1 to 5
Accomplishment	1.64	0.64	1.87	0.89	1.85	0.85	1 to 5
Total BO	1.69	0.48	1.77	0.66	1.90	0.53	1 to 5
Overtraining			4.14	1.13	3.99	1.31	1 to 10
Overuse injury			1.30	0.48	1.53	0.52	1 (yes)/2 (no)

Intrinsic motivation remains high throughout the season, with an increase observed from T 1 to T 2, followed by a decrease from T 2 to T 3. Identified regulation remains high throughout the season. Amotivation shows low scores on all three time points, with an increase from T 1 to T 2. The self-determination index increases from T 1 to T 2, with a following decrease from T 2 to T 3. The exhaustion subscale reveals low scores, increasing throughout the season though. Sport Devaluation yield small scores on all three time points. The subscale of Reduced Sense of Accomplishment display low scores, with an increase throughout the season. Total Burnout displays low scores, increasing throughout the season. Overtraining yields low scores on both T 2 and T 3. Question of Overuse injury might be interpreted as leaning towards “yes” at T 2 and “no” at T 3.

5.1.2. Correlations T 1

Table 2: Correlations for self-determined motivation and burnout dimensions T 1
(Spearman`s RHO)

Variables	2	3	4	5	6	7
1. Self-determination index	-.532	-.542	.114	-.546	-.311	.225
2. Amotivation		.805**	.287	.786**	.753**	.285
3. Exhaustion			.524	.540	.899**	.208
4. Accomplishment				-.045	.719**	.549
5. Devaluation					.557*	.151
6. Total burnout						.408
7. Training hours						

* $P < 0.05$; ** $P < 0.01$

Self-determination index is negatively linked to exhaustion, devaluation and total burnout, at an insignificant level. Amotivation yields a significant, positive relationship to exhaustion, devaluation, and total burnout. Training hours prove an insignificant positive relationship to the accomplishment subscale in addition to total burnout.

5.1.3. Correlations T 2

Table 3: Correlations for self-determined motivation, burnout dimensions and overtraining T 2
(Spearman`s RHO)

Variables	2	3	4	5	6	7	8	9
1. Self-determination index	-.580*	-.399	-.222	-.781**	-.394	-.487	-.356	.054
2. Amotivation		.272	.729**	.764**	.795**	.370	.364	.444
3. Exhaustion			.511	.340	.614*	.105	.475	.317
4. Accomplishment				.511	.914**	-.014	.478	.547
5. Devaluation					.710**	.328	.608*	.396
6. Total burnout						.154	.558*	.585*
7. Overtraining							.290	.110
8. Overuse injury								.560*
9. Training hours								

* $P < 0.05$; ** $P < 0.01$

Self-determination index yields a significant negative relationship to the subscale of devaluation. A meaningful negative relationship is also evident with exhaustion, total burnout, overtraining, and overuse injury. Amotivation is positively

linked to accomplishment, devaluation, and total burnout at a significant level. A positive link to both overtraining, overuse injury, and training hours is also evident, yet insignificant. Overtraining is positively linked to the subscale of devaluation at an insignificant level. Overuse injury is positively linked, at a significant level with devaluation, total burnout and training hours. At an insignificant level, overuse injury is linked to exhaustion and the accomplishment subscale of burnout. Training hours relates positively with total burnout and overuse injury, at a significant level and meaningfully linked to all subscales of burnout.

5.1.4. Correlations T 3

Table 4: Correlations for self-determined motivation, burnout dimensions and overtraining T 3 (Spearman`s RHO)

Variables	2	3	4	5	6	7	8	9
1. Self-determination index	-.366	.033	-.221	-.324	-.400	-.729**	.000	-.209
2. Amotivation		.197	.135	.830**	.409	.224	.165	.402
3. Exhaustion			.356	.449	.605*	-.173	-.615*	-.040
4. Accomplishment		.356		.223	.864**	.235	-.063	.687**
5. Devaluation		.449	.223		.609*	-.006	.146	.389
6. Total burnout		.605*	.864**	.609*		.201	-.082	.609*
7. Overtraining		-.173	.235	-.006	.201		-.165	.365
8. Overuse injury		-.615*	-.063	.146	-.082	-.165		.383
9. Training hours		-.040	.687**	.389	.609*	.365	.383	

* $P < 0.05$; ** $P < 0.01$

Self-determination index is negatively linked at an insignificant level to both devaluation and total burnout. SDI also yields a negative relationship to overtraining, at a significant level. Amotivation is positively linked to devaluation, at a significant level and insignificantly related to both total burnout and training hours. Overtraining is positively linked, yet insignificant to training hours.. Overuse injury yields a negative relationship with the subscale of exhaustion at a significant level and is positively linked with training hours. Training hours is positively and significantly related to reduced sense of accomplishment and total burnout. At an insignificant level, training hours is positively linked to devaluation, overtraining, and overuse injury.

5.2. Seasonal Variation

5.2.1. Effect size

Table 5: Effect sizes (Cohens` *d*) for seasonal changes

Variable	T 1-2	T 2-3	T 1-3
SDI	0.22*	0.10	0.11
AM	0.15	0.27*	0.10
Exhaustion	0.16	0.50**	0.84***
Accomplishment	0.36*	0.03	0.32*
Devaluation	0.09	0.00	0.00
Total burnout	0.17	0.19	0.44**
Overtraining		0.14	

*Small ES; **Moderate ES; ***Large ES

Self-determination index yields a small ES on T 1-2. Amotivation show a small ES on T 2-3. Exhaustion displays a moderate ES on T 2-3 and a large ES on T 1-3. The accomplishment subscale shows a small ES on both T 1-2 and T 1-3. Total burnout displays a moderate ES on T 1-3.

5.2.2. Wilcoxon`s Signed-rank test

Table 6: Wilcoxon`s test of significant change

Variable	T 1-2	T 2-3	T1-3
SDI	0.31	0.65	0.38
AM	0.41	0.15	0.89
Exhaustion	0.81	0.02*	0.005**
Accomplishment	0.06	0.83	0.22
Devaluation	0.66	0.64	0.78
Total burnout	0.52	0.16	0.009**
Overtraining		0.46	

* $P < 0.05$; ** $P < 0.01$

Exhaustion displays significant changes on T 2-3 ($P < 0.05$) and T 1-3 ($P < 0.01$). Total burnout reveals significant change on T 1-3 ($P < 0.01$). The remaining variables do not display significant changes on the different time points.

5.3. Case description

Cases are chosen to reflect the forestalled hypotheses in that different degree of self-determined motivation possibly have an effect on athlete burnout. Additionally, a case with symptoms of overtraining is presented. Cases are chosen on basis of self-determination indexes, total burnout, and overtraining scores.

Case 1: Elevated signs of total burnout (>3.00) at the end of the season, accompanied by low self-determination index (<13.0) and elevated score on amotivation (>2.5) at one or several time points.

Case 2: Low signs of total burnout ($<.2.0$) accompanied by a high self-determination index (>18.0) and low score on amotivation (<2.0) on all three time points.

Case 3: Elevated signs of overtraining (>5.0)

5.3.1. Case 1

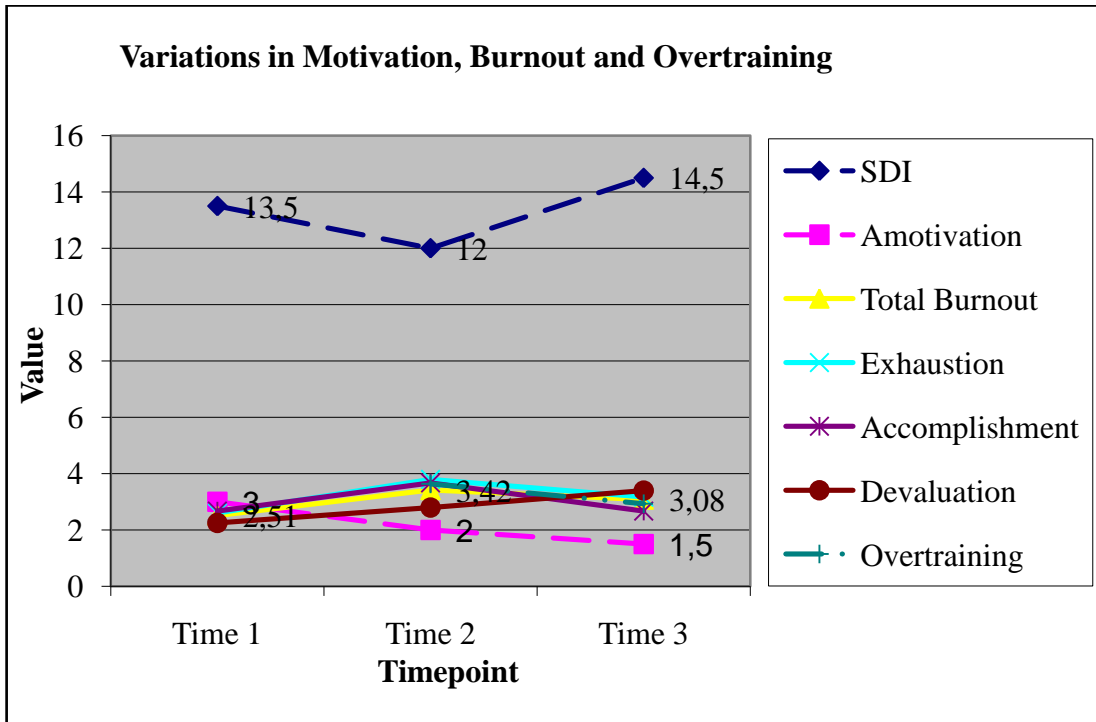


Figure 3: Description of case yielding high scores on total burnout at season's end accompanied by elevated score on amotivation and lowered SDI-score at one or several time points.

Table 7: Descriptive statistics for Case 1

Variable	T 1	T 2	T 3
SDI	13,5	12	14,5
AM	3	2	1,5
Exhaustion	2,6	3,8	3,17
Accomplishment	2,67	3,67	2,67
Devaluation	2,25	2,8	3,4
Total burnout	2,51	3,42	3,08
Overtraining		3,64	2,93

Case 1 yields a high total burnout score at T 3. This score is accompanied by lowered self-determination index at T 2 and elevated score on amotivation at T 1. Notably one can observe a decrease in self-determined motivation from T 1 to T 2 simultaneously as an increase in total burnout emerges. All dimensions of burnout are highest at T 2.

5.3.2. Case 2

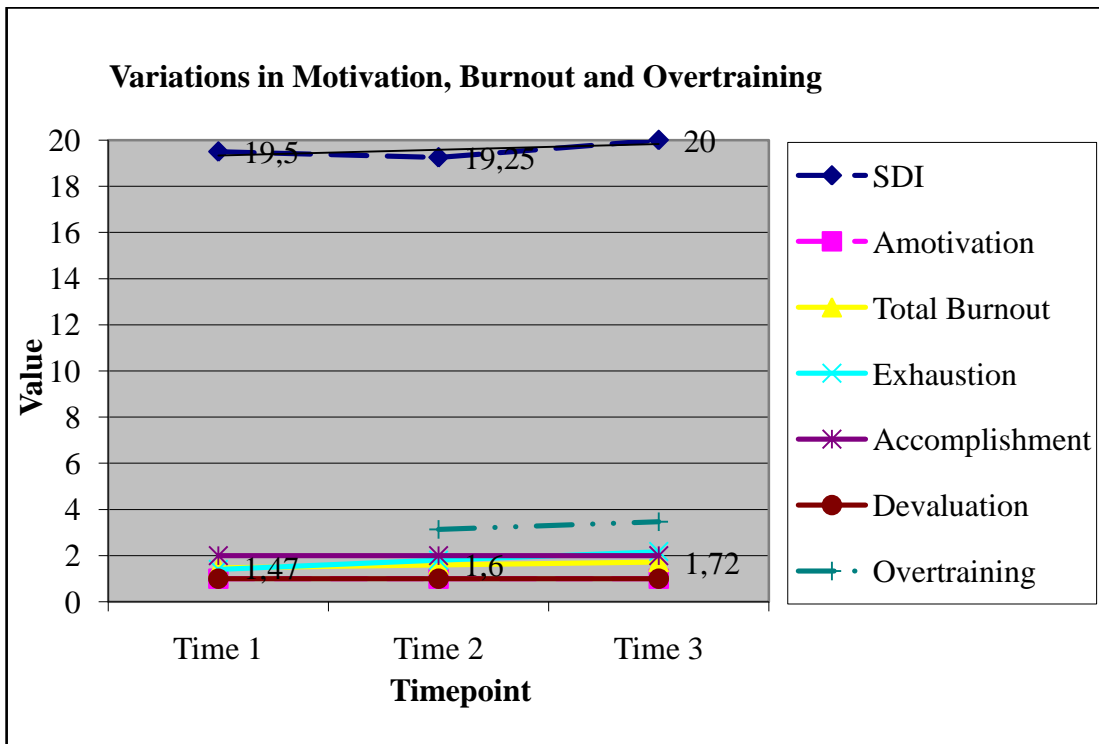


Figure 4: Description of case yielding low score on total burnout at seasons` end accompanied by high score on autonomous motivation at any time point.

Table 8: Descriptive statistics for Case 2

Variable	T 1	T 2	T 3
SDI	19,5	19,25	20
AM	1	1	1
Exhaustion	1,4	1,8	2,17
Accomplishment	2	2	2
Devaluation	1	1	1
Total burnout	1,47	1,6	1,72
Overtraining		3,14	3,47

Case 2 displays low scores of total burnout additional to a high self-determination index on all three time points. Amotivation yields low scores on all three time points. Remaining subscales of burnout and overtraining present low scores.

5.3.3. Case 3

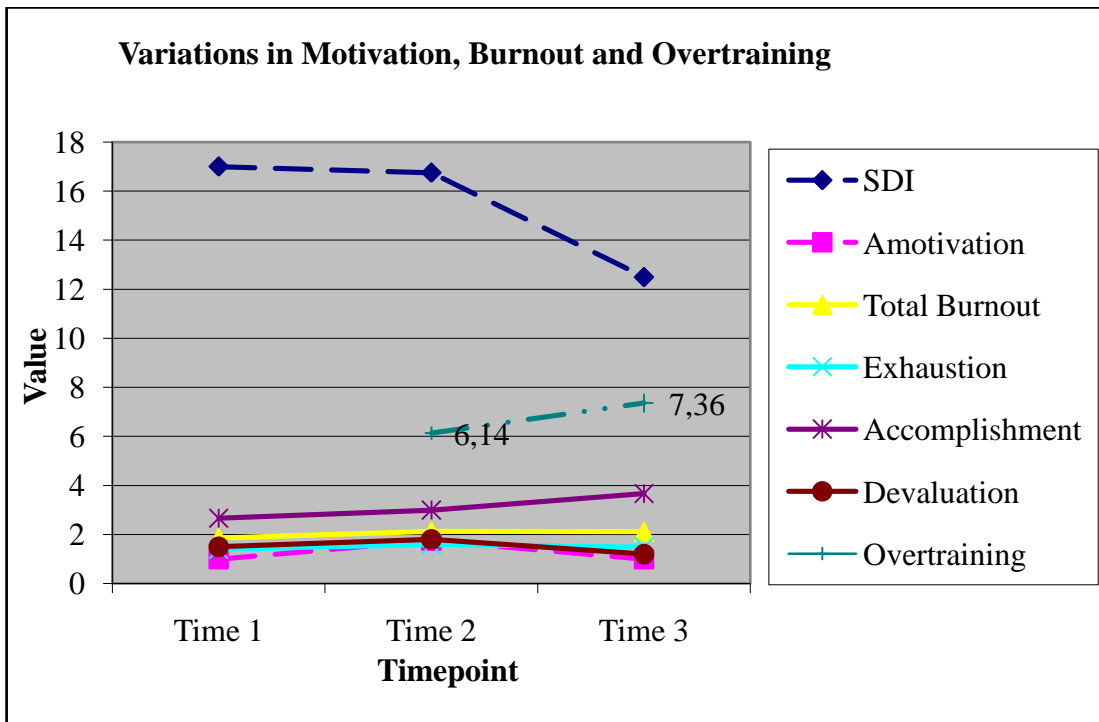


Figure 5: Description of case yielding high scores on overtraining at any time point.

Table 9: Descriptive statistics for Case 3

Variable	T 1	T 2	T 3
SDI	17	16,75	12,5
AM	1	1,75	1
Exhaustion	1,4	1,6	1,5
Accomplishment	2,67	3	3,67
Devaluation	1,5	1,8	1,2
Total burnout	1,86	2,13	2,12
Overtraining		6,14	7,36

Case 3 displays a high score on symptoms of overtraining. There is an observed increase in symptoms of overtraining simultaneously as self-determination index decreases meaningfully on T 2-3.

6.0 Discussion

The aim of the current studies was to investigate seasonal variations in self-determined motivation, symptoms of overtraining, and athlete burnout. Additionally, possible relationships between these variables over the course of a competitive season are examined. Findings are discussed as followed: (1) correlations at T 1, 2 and 3; (2) seasonal variations in motivation, overtraining and athlete burnout; (3) case-presentation; (4) limitations and (5) further studies, implications and conclusions.

6.1. Correlations at T 1

As presented in Table 2, self-determination index yields a negative relationship with all dimensions of athlete burnout, except the subscale of accomplishment. Even though not statistical significantly, we assume this relationship to be meaningful and partially in line with hypothesis 1. Contemporary research has linked self-determined motivation negatively with dimensions of athlete burnout (Lemyre et al., 2007; Lemyre et al., 2006). This is also in line with the findings of intrinsic motivation being negatively linked to burnout (Cresswell & Eklund, 2005; Gould et al., 1996a), adding to the current body of knowledge, demonstrating that athletes fuelled by intrinsic and autonomous motives are more likely to steer clear of maladaptive outcomes. Failing to find a meaningful relationship between self-determined motivation and the accomplishment subscale has been explained earlier by the time point of the season (early spring being distal from the competition phase starting in December) and the unique context of being an athlete representing a national or Olympic team (Vansteenkiste, Simons, Lens, Sheldon, & Deci, 2004; Lemyre et al., 2007). When being selected for a national team, you are generally among the best athletes in your country as well as competing at the international level. According to Vansteenkiste and colleagues (2000) this might create a psychological dividend and prompt these athletes' recognition of ability, constructing a form of buffer from the feeling of not performing. This might be especially evident when the competitive season is some time away. Lemyre and colleagues (2007) found no relationship between Olympic team athletes' self-determined motivation and symptoms of burnout. However, this was not the case among junior elite athletes, where self-determined motivation indeed was a precursor of athlete burnout (Lemyre et al., 2007). The population in current study contained a mix

of both senior and junior athletes, below the age of 23 years. Possibly; self-determined motivation does not only explain burnout among junior athletes, but also athletes aged below 23 years at this time point. These findings are then partially in line with the findings of Lemyre et al (2007), giving support to self-determinations impact on athlete burnout among young athletes.

Amotivation reveals a strong positive relationship with the exhaustion and devaluation subscale, in addition to total burnout. Results yield no relationship with the accomplishment subscale. This is partially in line with hypothesis 2. Contemporary research has positively linked amotivation to athlete burnout (Cresswell & Eklund, 2005; Gould et al., 1996a). Cresswell and Eklund (2005) pointed out a meaningful relationship between amotivation and all dimensions of burnout, something these results partially supports. The research of Gustafsson and colleagues (2008) also highlights the link between an athlete experiencing burnout and the absence of motivation. Gagnè et al (2000) also supports the possible maladaptive outcome of an individual being motivationally withdrawn (amotivated). Lemyre and colleagues (2006) have emphasized the importance of athletes not having a negative development from intrinsic motives to more maladaptive motivational manifestations. Such trends potentially increase athlete burnout propensity.

6.2. Correlations T 2

Results presented in Table 3 prove self-determined motivation to be meaningfully linked to the devaluation subscale in addition to total burnout, exhaustion, overtraining and overuse injury. This partially supports hypothesis 1; in that self-determined motivation is negatively linked to dimensions of burnout. Contemporary studies have linked intrinsic and self-determined motives negatively to burnout dimensions (Cresswell & Eklund, 2005; Lemyre et al., 2007; Lemyre et al., 2006), giving support to the findings at T 2. A strong relationship between self-determined motivation and the devaluation subscale has previously been pointed out. Devaluation is considered the most cognitive aspect of athlete burnout (Lemyre et al., 2006) and it is not surprising that self-determined motivation is negatively related to maladaptive cognitive outcomes like devaluation. This burnout dimension is characterized by no

longer viewing one's investment in sport worthwhile, making a motivational withdrawal from an activity one's being enjoyed and considered meaningful.

As stated earlier, the accomplishment subscale does not seem to relate to motivational aspects as strong as previous studies have stated. However the fact that self-determined motivation relates negatively to the exhaustion subscale is contradictory to earlier findings by Creswell and Eklund (2005) stating exhaustion is not to be viewed as a general mediator for athlete burnout in rugby populations. This might be due to contextual differences in x-c skiing and rugby populations. X-c skiing demands excessive training both in hours and intensity, possibly serving as an explanation to why the exhaustion subscales proves this relationship with self-determined motivation in current population. This adds to the findings of Lemyre et al (2007) where a relationship between self-determined motivation and exhaustion did emerge.

Amotivation is positively linked to devaluation, accomplishment and total burnout at T 2. This is partially in line with hypothesis 2, in that amotivation show a close relationship to athlete burnout. Several authors have proposed this relationship (Cresswell & Eklund, 2005; Gould et al., 1996a; Gustafsson et al., 2008; Lemyre et al., 2006) adding to the further knowledge of the maladaptive nature of being motivationally withdrawn. Interestingly, the subscale of exhaustion is not linked to feelings of being amotivated at this time point. A possible explanation might be the nature of this subscale being more complex than only involving motivational aspects. Authors have speculated if the exhaustion subscale has a close link with physiological as well as psychological parameters (Hodge et al., 2007) and that seasonal variations in training/competitive load possibly explain why exhaustion does not relate as strong as other burnout dimensions (Creswell, 2008).

Overtraining yielded a positive relationship with the devaluation subscale, giving partially support of hypothesis 3. Previous studies have also pointed out a link between symptoms of overtraining and athlete burnout (Lemyre et al., 2007). However, the study by Lemyre et al (2007) did not find a relationship between overtraining and devaluation. This study removed the devaluation subscale from the analysis due to poor reliability. Devaluation of sport is considered the most cognitive aspect of athlete burnout. When an athlete suffers from symptoms of overtraining and is inhibited from performing as well as his/hers potential, this might develop into maladaptive cognitive

outcomes, like devaluation of participation. Excessive training, monotonous training, considerably proportions of high intensity training and poor recovery are factors that might catalyze the process developing from an adaptive training continuum into overtraining resulting in athlete burnout (Gustafsson et al., 2007). Long term overreaching and overtraining; leading to a decrease in performance can indeed be developmental stages for athlete burnout as stated by Gustafsson and colleagues (2007). Performance impairment might be psychologically difficult to handle for an elite level athlete, thereby making a link between symptoms of overtraining and devaluation of sport participation. Self-validation based on athletic performances is difficult to maintain when being physically exhausted, leading to performance decline. The objective fact of underperforming in addition to the feeling of being overtrained is a motivationally difficult combination, possibly leading to athlete burnout. It is however interesting that overtraining reveals its link to the devaluation subscale and not to the subscale of exhaustion. A previous study has proven a link between exhaustion and overtraining (Lemyre et al., 2007); this relationship however, did not emerge in the current population. A case study investigating burnout and training by Gustafsson and colleagues (2007) interestingly revealed two of the athletes scoring higher and one marginally lower on the devaluation subscale, compared to the subscale of exhaustion. This also supports a link between symptoms of overtraining and devaluation. Appealingly, there is not only a physical challenge connected to overtraining, but a challenging cognitive aspect of an athlete suffering from overtraining as well. Taking this in consideration one needs to understand and help athletes` cope with mental issues in addition to the physical recovery training regarding symptoms of overtraining.

Results also indicate a positive relationship between overuse injury and all dimensions of athlete burnout. A previous study by Creswell and Eklund (2005) has highlighted the relationship between injuries and burnout. Lengthy periods of recovery training and set back in performance are variables that influence athletes when suffering from injuries. Appealingly, this is also evident for x-c skiers. Not being able to train as planned might impair physical development. When combined with the fact that injured athletes have to deal with less motivational recovery training and being excluded from training with team mates, this is potentially a motivationally challenging situation, possibly catalyzing athlete burnout.

The relationship between self-determined motivation and overtraining is also interesting. Lemyre and colleagues (2007) did not find such pattern between these variables. This suggests self-determined motivation to be preventive of an athlete developing symptoms of overtraining, which Silva (1990) labelled as a maladaptive outcome from excessive training stress. Lemyre et al (2007) stated that athletes fuelled by extrinsic motivation might carry out training without listening to bodily signals and following training plans without questioning. The opposite seems to be the case when driven by self-determined motives.

6.3. Correlations T 3

Results presented in Table 4 shows a partially support of hypothesis 1. Self-determined motivation yields a negative relationship with devaluation and total burnout. Apparently self-determined motivation is negatively associated with athlete burnout as stated in previous studies (Cresswell & Eklund, 2005; Lemyre et al., 2007; Lemyre et al., 2006). The meaningful relationship with the devaluation subscale suggests a link between motivation and the most cognitive aspect of athlete burnout. When athletes are driven in sport for autonomous reasons they less likely develop symptoms of burnout. This is especially evident for the cognitive dimension regarding not valuing your sport and viewing this participation as not being meaningful. Being fuelled by self-determined motivation in the sport one participates in, is adaptive for athletes both in steering away from athlete burnout and developing one`s performances. Vallerand and Losier (1999) stated that when athletes feel their autonomy is supported, an increase in actual performance was observed in elite swimmers. It is important to notice that not only would self-determined motives function as a buffer for maladaptive behavioral consequences; there is also a potential for performance enhancement. It is not clear however why a relationship with the other subscales of burnout did not emerge. At this time point the athletes had participated in several competitions, serving as an indicator of both accomplishment and the cumulative demands attached to competitions and training regarding exhaustion, as stated by previous papers (Gustafsson et al., 2007; Lemyre et al., 2007).

As for hypothesis 2, the results provide partial support by yielding a positive relationship between amotivation and the devaluation subscale and total burnout.

Results did not show any meaningful relationship between amotivation, exhaustion and reduced sense of accomplishment. This is again in line with previous studies, stating that the distal ends of the motivational continuum is closely linked to burnout propensity (Cresswell & Eklund, 2005) and that lowered feelings of self-determined motivation increase the possibility for symptoms of athlete burnout (Lemyre et al., 2007; Lemyre et al., 2006). Gagnè and colleagues (1999) reports of amotivation being linked to instable and fragile self-esteem, and lowered feelings of vitalities, harmonizes with the assumption that amotivation as a construct is closely linked to athlete burnout.

Overtraining did not relate to any dimensions of athlete burnout at this time point. This might be due to the competitive season almost coming to an end and that training stressors are not as intense at this time of season. It is more likely that motivational aspects prove a link to burnout at this time of the year for x-c skiers. When looking at motivational variables in regard to overtraining, the results yield meaningful relationships worth mentioning. This will be discussed further later.

Overuse injury relates negatively with the exhaustion subscale, at a significant level. This relationship possibly emerges because these injured athletes` have stopped training and competing for the current season and started preparing the forthcoming season. This involves getting rid of the injury with low training stressors, making the physical stress lower. Additionally, the competitive season coming towards the end, might lead injured athletes in direction of not paying as much attention to what competitors do. Possibly this decreases the emotional exhaustion one might experience in seeing others train when one self are disabled from regular training.

6.4. Seasonal variations in motivation, burnout and overtraining

Results from Table 5 indicate a meaningful change in self-determined motivation on T 1-2. Changes at this time point is considered small, in effect size. As observed in Tables 3 and 4, self-determined motivation is negatively associated with athlete burnout and symptoms of overtraining, suggesting that athletes` training for autonomous reasons has a good understanding for the process of training. One might speculate if an increase in self-determination score possibly can sharpen athletes` attention in training and thereby make them less vulnerable to maladaptive outcomes.

A meaningful increase in self-determination index on T 1-2, is accompanied by T 2 yielding the strongest negative relationship to burnout dimensions, as presented in table 3. Contemporary research has established a close link between a decrease in self-determined motivation and athlete burnout (Lemyre et al., 2006). These findings indicate that increased feelings of self-determination might be seen as preventive of athlete burnout.

When evaluating the changes on the different burnout dimensions in Table 5, there is an observable change over the course of the season. Exhaustion yields a moderate and strong effect size in addition to statistical significance on both T 2-3 and T 1-3. Reduced sense of accomplishment yields a small effect size on both T 1-2 and T 1-3 and total burnout reveals a moderate effect size in changes on T 1-3, also statistically significant. These results suggest a meaningful and significant increase in burnout dimensions throughout the season, some of them simultaneously as amotivation (T 2-3) decreases. T 2 serves as the time point where amotivation-score is at its highest possibly influencing development of athlete burnout. This is in line with previous studies having established a close link between amotivation and burnout (Cresswell & Eklund, 2005; Gould et al., 1996a; Gustafsson et al., 2008; Lemyre et al., 2006).

Results indicate the importance of athletes` feeling they participate in sports for self-determined and autonomous reasons, to prevent them from developing maladaptive behavioral manifestations. It is also important for coaches and leaders to notice, that even though athletes` might be motivated for self-determined reasons, a small increase of feeling amotivated might have an impact on burnout propensity. Coaches could benefit from using scores on self-determination indexes and amotivation as a monitoring tool to evaluate whether athletes are in the developmental stages of burnout.

Contradictory to the statement of Creswell and Eklund (2006) saying that changes in exhaustion is not to be viewed as a general mediator in the rugby population, it appears that in current x-c skiing population, changes in exhaustion *is* a general mediator. Exhaustion serves as the subscale of burnout revealing the largest increase from the start of the season to seasons` end.

The accomplishment subscale did also change meaningfully throughout the season, supporting the conclusion of Creswell and Eklund (2006). When an athlete has completed the preparation phase of the season, transiting into the phase of competition,

answers on whether or not one has accomplished personal goals reveals. This evaluation might range from developing physical capacity in training to objective results in competitions. Athletes are then provided with the information needed to feel satisfied with performance or develop feelings of reduced personal accomplishment.

Devaluation yields no changes on the different time points. Even though stated earlier that devaluation represent the closest link to motivational constructs, meaningful changes in this subscale was not observed. When evaluating this trend, one needs to consider that the current population reveals high self-determination indexes on all three time points. When being motivated for self-determined reasons one might assume that devaluation remains low and relatively unchanged. Seemingly the other subscales of burnout are more sensitive to change in strength of self-determined motivation and amotivation, than the devaluation subscale. Devaluation of sport participation has been mentioned as one of the last stages in development of athlete burnout, because of the absence of motivation burnout and lack of interest (Gustafsson et al., 2007; Lemyre et al., 2006). Taking this into consideration, these highly motivated athletes are not burned out and would not display meaningful changes in the devaluation subscale.

6.5. Case 1: High burnout/ lowered self-determined motivation

Contemporary research have used cut-off values ranging from 2.2 to 4.9 when categorizing athletes with high or elevated burnout symptoms (Gustafsson et al., 2007; Hodge et al., 2008; Lemyre et al., 2006). Taking this in consideration, a cut off value of 3.0 is defensible when labeling an athlete in this population with elevated signs of burnout. As presented in Figure 3, this athlete display heightened scores on the different burnout subscales. Athletes having dropped out of their sport due to burnout experiences, have reported lower burnout-scores than what's the case of this current athlete (Gustafsson et al., 2007). An elevated burnout score is important to notice taking the perspective these athletes` are considered among the most talented x-c skiers in Norway. When evaluating the motivational profile of this athlete, the results yield elevated score on amotivation at the start of the season and lowered self-determination index at T 2. Lemyre et al (2006) proposed that athletes with a negative motivational trend throughout the season were more likely to experience symptoms of burnout. Lemyre and colleagues (2007) have also stated that athletes` self-determined motivation

at start of season may be a precursor of maladaptive outcomes like athlete burnout and overtraining. Additionally, there is evidence to the fact that increased feelings of being amotivated are closely linked to athlete burnout (Cresswell & Eklund, 2005; Gould et al., 1996a; Gustafsson et al., 2008; Lemyre et al., 2006). The presented case reports a lowered self-determined motivation and an increased amotivation score. This is accompanied by elevated signs of burnout throughout the season, corresponding well with previous studies. As proposed by Deci and Ryan (2000), participating in sport for reasons low in self-determination might produce feelings of being controlled in the athletic context thereby being characterized by poor adherence and maladaptive behavioral manifestations. Feelings of control and entrapment in sport are, according to Raedeke (1997), closer linked to athlete burnout than participation for reasons of enjoyment. Hodge et al (2008) also pointed out that athletes classified as “high burnouts” differed significantly from “low burnouts” on perceived autonomy. Giving athletes good possibilities for developing self-determined motives for their participation seems to be a good advice for preventing maladaptive outcomes like athlete burnout. Athletes with motivation perceived as controlling their behavior, in addition to interpreting the sport context as entrapping might easier develop athlete burnout, especially when combined with absence of motivation. It is also severe that young and talented athletes representing the Norwegian national system in x-c skiing could be labelled as “active burnouts”. Continued athletic participation with elevated signs of burnout, might possibly impair level of involvement. This could be observed in selected case with a meaningful decrease in self-determined motivation at T 2, simultaneously as the highest burnout scores is observed. It is also around these two time points the highest score on amotivation is observed. Less involvement in training might lead to consequences as less focus on training with sufficient quality, less focus on recovery and prioritizing other activities as more important. A sense of entrapment might be the differential factor between athletes leaving sport due to burnout and those being labelled as active burnouts (Raedeke, 1997). This case reflects hypothesis 2, assuming a link between the lowered self-determined motivation, amotivation and athlete burnout.

6.6. Case 2: Low burnout/ high self-determined motivation

As proposed in hypothesis 1, a relationship between self-determined motivation and athlete burnout seems to be evident. The correlation tables yield a meaningful relationship between self-determined motivation and low signs of athlete burnout. Contemporary studies have established a clear link between adaptive motivational constructs and positive behavioral consequences (Cresswell & Eklund, 2005; Gagnè et al., 1999; Lemyre et al., 2007; Lemyre et al., 2006). When being driven by self-determined motives, athletes might be prevented from maladaptive outcomes. Additionally, as stated by Vallerand and Losier (1999) and Mallet (2005), performance enhancement might serve as an end product from self-determined motivation. When evaluating this case, Figure 4 reveals a high score on the self-determination index throughout the season, accompanied by a total burnout score ranging from lowest 1.47 to highest, 1.72. This athlete displays no sign of being in the developmental stages of burning out, possibly explained by the high scores on self-determined motivation. As stated earlier, autonomy-supportive environments and self-determined motivation are both catalysts for performance improvement as well as a buffer against maladaptive outcomes like athlete burnout and overtraining. Locus of causality is clearly internal, meaning the regulation of behavior is self induced and willingly (DeCharms, 1968). Training with top level quality is necessary for young talents transiting into the elite level. There is no doubt that focus on given tasks, effort, persistence and goal attainment is meaningfully improved by being driven by self-determined motives (Deci & Ryan, 2000; Smith et al., 2007). Coaches and leaders need to be aware of the possible adaptive outcomes self-determined motivated behavior might produce in addition to the maladaptive outcomes it likely inhibits.

Low reports of amotivation are also important when evaluating the chosen case. When perceiving one`s athletic participation free from amotivational aspects, one is clearly driven by autonomous motives. This is considered helpful in steering clear of maladaptive outcomes one might develop when finding parts of training and competing in sports amotivating.

6.7. Case 3: Symptoms of overtraining

As presented in Figure 5, this athlete clearly indicates symptoms of overtraining. According to Silva (1990), overtraining is characterized by a repetitive failure in bodily attempts to cope with chronic training stressors. Malfunctions in physiological parameters and changes in mental state and athletic performances are easily observed. Interestingly the increase in symptoms of overtraining occurs simultaneously as self-determined motivation decreases. As stated previously a lowered sense of self-determined motivation might have maladaptive consequences like burnout, but this relationship however have not been so distinct regarding symptoms of overtraining (Lemyre et al., 2007). Even though, there is no doubt that overtraining is an undesirable outcome of training, as stated by several authors (Gustafsson et al., 2007; Kenttä & Hassmèn, 1998; Silva, 1990) and results from Table 3, and 4 yields a meaningful link between motivational constructs and overtraining in the current population. Self-determined motivation is negatively associated with overtraining, suggesting that a decrease in autonomous motives for participation might induce overtraining symptoms. When athletes are driven by self-determined motives; they presumably listen to bodily signals and adjust training plans and recovery-actions according to their goal of constant performance enhancement. The requirement of recovery has often been neglected in physical training. As stated by Kenttä and Hassmèn (1998), it is not the excessive training per se that induces problems of overtraining, but the lack of sufficient recovery. One might speculate that athletes driven by self-determined motives understand this concept of training and adjust training according to physical status, fatigue, and pursuit of the best possible training quality. The athlete presented in case 3 also display an increase in the accomplishment subscale, occurring when overtraining symptoms increases and self-determined motivation decreases. It has been stated that a decrease in performance have a close link to overtraining (Gustafsson et al., 2007; Kenttä & Hassmèn., 1998). When being in a state of overtraining the athletic performance is impaired, giving nutrition to a sense of reduced personal accomplishment.

6.8. Limitations

Using a longitudinal design has its strengths in the ability to observe changes over time in populations (Thomas et al., 2005). Observing seasonal changes in

motivational variables and signs of burnout and overtraining is considered meaningful to this thesis. Limitations concerning the current approach are problems with tracking participants due to moving, drop out and death. Participants getting familiar with the questionnaire might have also an interfering effect on their answers (Thomas et al., 2005). During current study, athletes might have widened their insight in the research area, thereby gaining more knowledge, possibly influencing their responses. Their natural development are possibly interfered, increasing the chance of a different picture emerging if they weren't included in the study. The methodical limitation of a long time series will however not be a restraining factor in this study. Time series of approximately 10 months will probably not be influenced by death or moving. Another methodological weakness possibly occurring is the problem of unclear semantic (Thomas et al., 2005).

Small sample size is considered a prohibiting factor from finding significant relationships between variables (Black, 1995; Thomas et al., 2005). The possibility of making a Type 2 error, accepting the H_0 , when there really is a difference increases with small samples. By evaluating practical significance and discussing meaningful relationships based on correlation scores from previous studies, this problem might be reduced. Significant correlation coefficients between burnout subscales and motivational aspects have appeared at a -0.13 level, using the SIMS questionnaire (Cresswell & Eklund, 2005). Most papers have statistical significant correlations at approximately 0.30 as the lowest observed coefficient between dimensions of athlete burnout and motivational parameters (Cresswell, 2008; Hodge et al., 2007; Lemyre et al., 2007; Lemyre et al., 2006). This is supportive of the choice regarding discussing insignificant correlations at a .30 coefficient level.

In current study we have investigated 36 % of the total population in Norway's national x-c skiing system, giving a good indication of this population. Clearly investigations with larger samples are needed to clarify significant relationships between the sets of variables and to determine significant values of variations on the different time points. This could be attained by making sure of a higher response rate from the population, something this study did not manage to bring about. If being allowed to contact athletes on training camps etc, this could be attained. Even though, this study has established many statistically significant findings in addition to meaningful relationships, possibly

with important practical implications for this elite athlete population. In studies where parts of an already small population are investigated, small differences might have relatively large practical impacts. Taking this in consideration, many researchers are not only interested in statistical significance, but practical significance as well (Vincent, 2005).

As stated by Kazis and colleagues (1988) effect sizes are powerful in determining practical meaningfulness in changes over time, something this study support. To compliment the calculations of effect size, significant changes was also evaluated using Wilcoxon's signed rank. This supports some of the changes deemed as meaningful by the effect sizes, but also proves that statistical insignificant relationships might be considered meaningful. Using both approaches gives strength in regard of evaluating changes and differences, in both statistical and practical meaningful terms (Kazis et al., 1988). Repeated measurements calculates Cohen's d using the formula; $M_1 - M_2 / SD_2$ (Thomas et al., 2005). However when a measurement series have a clear starting point, like this study, measuring changes over different time points, the standard deviation from this starting point (T 1) should be used as denominator (Kazis et al., 1988; Looney et al., 1994; Thomas et al., 2005).

Studying changes of health status over 21 weeks, have advocated the use of this effect size formula in finding possible meaningful variations (Kazis et al., 1988). The meaningfulness of the possible change has been stated as important for studies over time series.

The computation of a self-determination index was chosen as an approach when determining relationships between motivation, burnout and overtraining. The formula used in this study, differs from formulas used by Lemyre et al (2007, 2006) where amotivation was included in calculation of the self-determination index. Amotivation is described as *absence* of motivation (Deci & Ryan, 2000) thereby one can argue that amotivation is not to be viewed as fruitful when computing motivational indexes. Taking this in consideration, amotivation was excluded from calculating motivational quality in current study. The use of this approach also reduces variables included in the analyses, giving a more distinct picture of the possible relationship between self-determined motivation, athlete burnout and overtraining. Not being able to determine what motivational regulations which yield different relationships to athlete burnout are

not possible using this approach. However, previous studies have used the computation of self-determination indexes successfully (Lemyre et al., 2007, 2006). It has been stated that, the distal ends proves a meaningful relationship to athlete burnout whereas the extrinsic motives` relationship are more ambiguous, when evaluation the whole motivational continuum (Cresswell & Eklund, 2005).

In cases of small samples Chronbach`s α is easily influenced by individual responses. Chronbach`s α assuming a normality distribution might also produce a low value when data is skewed or flat distributed, giving support to setting an acceptable criterion below 0.70, as proposed by Nunally and Bernstein (1994). To defend this approach, Black (1999) proposes α -levels as low as .40 as acceptable, when dealing with small sample sizes. Evaluating individual items is also used to consider the consistency of the items (Black, 1999). Ideally, the higher value one can attain on the reliability test, the better. Using data from the individual items, one can decide which item to keep, refuse or revise to attain a acceptable Chronbach`s α level (Black, 1999). This thesis has tried to attain as high level of internal consistency as possible, and thereby excluding subscales and items when not meeting the .50 criterion.

6.9. Further studies

The results presented some additional relationships not being discussed in light of the hypotheses. A positive relationship between training hours and subscales of burnout did emerge on all time points. Training hours also represented a relationship with amotivation, overuse injury and overtraining. It has previously been stated that lack of time to be with friends and family has a positive relationship with athlete burnout (Kjørmo & Halvari, 2002). Giving athletes time to socialize outside the athletic arena seems important and might also serve as a plausible explanation to why training hours reveals such strong relationship with amotivation. One must also consider the relationship between training hours and overtraining, suggesting a link between how many training hours one executes and symptoms of both overtraining and overuse injury. This is interesting when knowing top level athletes` train approximately 1000 hours per year (Rusko, 2003). If this is to be the standard for training quantity, coaches, athletes and leaders need to be aware of the possible maladaptive outcome from such high amounts of training, giving support to Kenntä and Hassmèns` (1998) proposal of

monitoring training and recovery carefully. One also needs to evaluate whether or not all athletes are in the position physical and mentally to carry out this kind of training regimen. Interestingly the world famous skier Thomas Alsgaard won his gold medal in the 1994 Olympic Games in Lillehammer, training 450 hours per year (Alsgaard & Karlsen, 2008). It might not exclusively be the training hours per se that needs to be established, but also the quality and goals of the training one carries out. Further investigation to clarify the impact training hours have on both motivational factors in addition to symptoms of athlete burnout is needed.

Another interesting finding to be further investigated is the relationship between motivational constructs and symptoms of overtraining. As results presented in Table 3 reveals, overtraining and overuse injury is negatively related to self-determined motivation and positively related to amotivation, at a meaningful level. In Table 4, a negative link between self-determined motivation and symptoms of overtraining is established at a significant level. Contemporary research has not been able to establish a clear link between self-determined motivation and symptoms of overtraining in a population quite similar to the population in this study (Lemyre et al., 2007). This highlights the need for further investigation of these relationships and how differences in self-determined motivation might have various effects on training adaption and maladaptation. It is promising to observe that when driven by autonomous reasons for participation, athletes are directed clear of maladaptive outcomes. This relationship however is ambiguous and needs further investigation.

6.10. Practical implications and conclusion

These findings suggest that a negative relationship between self-determined motivation and burnout propensity indeed exists. On the other side; a positive relationship between amotivation and athlete burnout is evident. This is supportive of previous studies suggesting a link between motivation high and low in self-determination and burnout propensity (Cresswell & Eklund, 2005; Lemyre et al., 2007; Lemyre et al., 2006). Findings indicate that seasonal variations in self-determined motivation and amotivation might be linked to changes in burnout dimensions.

Overtraining did not function as a direct moderator for athlete burnout in current population, suggesting motivational variables are closer linked to athlete burnout. However; self-determined motivation proves a relationship with symptoms of overtraining, which is considered performance impairing (Silva, 1990; Kenttä & Hassmèn, 1998).

Taking this in consideration, coaches might use motivational quality as a monitoring tool in helping their athletes steer away from maladaptive outcomes in training. Giving nutrition to athletes` perception of being self-determined as well as preventing amotivational aspects in training is suggested. In coaches and athletes` quest for peak performances, this approach might be considered helpful.

7.0 References

- Alsgaard, T., & Karlsen, M. (2008). *Best på ski. Trening, teknikk, kosthold og konkurranse*. Tun.
- Black, R.B. (1999). *Doing Quantitative Research in the Social Sciences – An Integrated Approach to Research Design, Measurement and Statistics*. SAGE Publications Ltd
- Brunel, P. (1999). Relationship between achievement goal orientations and perceived motivational climate on intrinsic motivation. *Scandinavian Journal of Medicine and Science in Sports*, 9, 365-374.
- Cresswell, S.L., & Eklund, R. (2005). Changes in Athlete Burnout and Motivation over a 12-Week League Tournament. *Medicine & Science in Sports & Exercise*, 37, 1957-1966.
- Cresswell, S.L., & Eklund, R. (2006a). Changes in athlete burnout over a thirty-week “rugby year”. *Journal of Science and Medicine in Sport*, 9, 125-134.
- Cresswell, S.L., & Eklund, R. (2007). Athlete Burnout: A Longitudinal Qualitative Study. *The Sport Psychologist*, 21, 1-20.
- Cresswell, S.L. (2008). Possible early signs of athlete burnout: A prospective study. *Journal of Science and Medicine in Sport*, 12, 393-398.
- De Charms, R. (1968). *Personal Causation – The Internal Affective Determinants of Behaviour*. Academic Press, INC.
- Deci, E.L., & Ryan, R.M. (1985). Intrinsic motivation and self determination in human behavior. NY: Plenum
- Deci, E.L., & Ryan, R.M. (2000). The “what” and “why” of goal pursuits: Human needs

and the self determination of behavior. *Psychological Inquiry*, 11, 227-268.

Ericsson, K.A., Krampe, R.T., & Tesch-Römer, C. (1993). The role of deliberate practice in the acquisition of expert performance. *Psychological Review*, 100 (3), 363-406.

Gagnè, M., Ryan, R.M., & Bargmann, K. (2003). Autonomy Support and Need Satisfaction in the Motivation and Well-Being of Gymnasts. *Journal of Applied Sport Psychology*, 15, 372-390.

Gould, D. (1996). Personal motivation gone awry: Burnout in competitive athletes. *Quest*, 48, 275-289.

Gould, D., Udry, E., Tuffey, S., & Loehr, J. (1996a). Burnout in Competitive Junior Tennis Players: I. A Quantitative Psychological Assessment. *The Sport Psychologist*, 10, 322-340.

Gould, D., Udry, E., Tuffey, S., & Loehr, J. (1996b). Burnout in Competitive Junior Tennis Players: II. Qualitative Analysis. *The Sport Psychologist*, 10, 341-366.

Gould, D., Udry, E., Tuffey, S., & Loehr, J. (1997). Burnout in Competitive Junior Tennis Players: III. Individual Differences in the Burnout Experience. *The Sport Psychologist*, 11, 257-276.

Guay, F., Vallerand, R. J., & Blanchard, C. (2000). On the assessment of situational intrinsic and extrinsic motivation: The Situational Motivation Scale (SIMS). *Motivation and Emotion*, 24, 175-213.

Gustafsson, H., Kenttä, G., Hassmèn, P., & Lundquist, C. (2007). Prevalence of Burnout in Competitive Adolescent Athletes. *The Sport Psychologist*, 21, 21-37.

Gustafsson, H., Kenttä, G., Hassmèn, P., Lundquist, C., & Durand-Bush. (2007). The

- process of burnout: A multiple case study of three endurance athletes. *International Journal of Sport Psychology*, 38, 388-416.
- Gustafsson, H., Hassmèn, P., Kenttä, G., & Johansson, M. (2008). A qualitative analysis of burnout in elite Swedish athletes. *Psychology of Sport and Exercise*, 9, 800-816.
- Hodge, K., Lonsdale, C., & Ng, Y.Y.J. (2008). Burnout in elite rugby: Relationships with basic psychological needs fulfilment. *Journal of Sports Sciences*, 26, 835-844.
- Hollembeak, J., & Amorose, A.J. (2005). Perceived Coaching Behaviors and College Athletes' Intrinsic Motivation: A Test of Self-Determination Theory. *Journal of Applied Sport Psychology*, 17, 20-36.
- Jones, G., Hanton, S., & Connaughton, D. (2007). A Framework of Mental Toughness in the World's Best Performers. *The Sport Psychologist*, 21, 243-264.
- Kazis, L.E., Anderson, J.J., & Meenan, R.F. (1988). Effect Sizes for Interpreting Changes in Health Status. *Medical Care*, 27, Supplement, 178-189.
- Kenttä, G., & Hassmèn P. (1998). Overtraining and Recovery – A Conceptual Model. *Sports Medicine*, 26, 1-16.
- Kjørmo, O., & Halvari, H. (2002) Relation of burnout with lack of being with significant others, role conflict, cohesion, and self-confidence among Norwegian Olympic athletes. *Perceptual and Motor Skills*, 94, 795-804.
- Lemyre, P-N., Treasure, D.C., & Roberts, G.C. (2006). Influence of Variability in Motivation and Affect on Elite Athlete Burnout. *Journal of Sport and Exercise Psychology*, 12, 32-48.

- Lemyre, P-N., Roberts, G.C., & Stray-Gundersen, J. (2007). Motivation, overtraining, and burnout: Can self-determination predict overtraining and burnout in elite athletes? *European Journal of Sport Science*, 7, 115-126.
- Lemyre, P-N., Hall, H.K., & Roberts, G.C. (2008). A social cognitive approach to burnout in elite athletes. *Scandinavian Journal of Medicine and Science in Sports*, 18, 221-234.
- Looney, M.A., Feltz, C.J., & VanVleet, C.N. (1994). The reporting and analysis of research findings for within-subject designs: Methodological issues for meta-analysis. *Research Quarterly for Exercise and Sport*, 65, 363-366.
- Mallett, C.J. (2005). Self-Determination Theory: A Case Study of Evidence-Based Coaching. *The Sport Psychologist*, 19, 417-429.
- Maslach, C., & Jackson, S.E. (1981). The measurement of experienced burnout. *Journal of Occupational Behavior*, 2, 99-111.
- Nicholls, J.G. (1989). *The competitive ethos and democratic education*. Cambridge, MA: Harvard University Press
- Nunnally, J.C., & Bernstein, I.H. (1994). *Psychometric Theory* (3rd ed.). McGraw-Hill Inc.
- Ommundsen, Y., & Kvalø, S.E. (2007). Autonomy-Mastery Supportive or Performance Focused? Different teacher behaviours and pupils` outcome in physical education. *Scandinavian Journal of Educational Research*, 51, No. 4, 385-413.
- Reinboth, M., & Duda, J.L. (2006). Perceived motivational climate, need satisfaction and indices of well-being in team sports: A longitudinal perspective. *Psychology of Sport and Exercise*, 7, 269-286.

- Reinboth, M., Duda, J.L., & Ntoumanis, N. (2004). Dimensions of Coaching and Behavior, Need Satisfaction, and the Psychological and Physical Welfare of Young Athletes. *Motivation and Emotion*, 28, 297-313.
- Raedeke, T.D. (1997). Is athlete burnout more than just stress? A sport commitment perspective. *Journal of Sport and Exercise Psychology*, 19, 396-417.
- Raedeke, T.D., & Smith, A.L. (2001). Development and Preliminary Validation of an Athlete Burnout Measure. *Journal of Sport & Exercise Psychology*, 23, 281-306.
- Raglin, J.S. Overtraining and staleness: psychometric monitoring of endurance athletes. In: Singer RB, Murphey B, Tennant LK, editors. Handbook of research on sport psychology. New York (NY): Macmillian, 1993; 840-50.
- Roberts, G.C. (2001). Understanding the dynamics of motivation in physical activity: The influence of achievement goals on motivational processes. In G.C. Roberts (Ed), *Advances in Motivation in Sport and Exercise*. (pp. 1-50). Champaign, IL: Human Kinetics.
- Rusko, H. (2003). *Handbook of Sports Medicine and Science – Cross Country Skiing*. Blackwell Science Ltd.
- Ryan, R.M., & Deci, E.L. (2000a). Self-Determination Theory and the Facilitation of Intrinsic Motivation, Social Development, and Well Being. *American Psychologist*, 55, 68-78.
- Ryan, R.M., & Deci, E.L. (2000b). The Darker and Brighter Sides of Human Existence: Basic Psychological Needs as a Unifying Concept. *Psychological Inquiry*, 11, 319-338.
- Silva, J.M. (1990). An analysis of the training stress syndrome in competitive athletics.

The Journal of Applied Sport Psychology, 2, 5-20.

Smith, A., Ntoumanis, N., & Duda, J. (2007). Goal Striving, Goal Attainment, and Well-Being: Adapting and Testing the Self-Concordance Model in Sport.

Journal of Sport and Exercise Psychology, 29, 763-782.

Thomas, J.R., Nelson, J.K., & Silverman, S.J. (2005). *Research methods in physical activity* – 5th ed. Human Kinetics

Vallerand R.J., Deci, E.L., & Ryan R.M. (1987). Intrinsic Motivation in Sport. In K.B Pandolph (Ed.), *Exercise and Sport Sciences Reviews, Volume 15* (pp. 389-425). Macmillian Publishing Company.

Vallerand, R.J., & Losier, G.F. (1999). An Integrative Analyses of Intrinsic and Extrinsic Motivation in Sport. *Journal of Applied Sport Psychology*, 11, 142-169.

Vansteenkiste, M., Simons, J., Lens, W., Sheldon, K.M., & Deci, E.L. (2004). Motivating learning, performance, and persistence: The synergistic effects of intrinsic goal contents and autonomy-supportive contexts. *Journal of Personality and Social Psychology*, 87, 246-260.

Vincent, W.J. (2005). *Statistics in Kinesiology* (3rd ed.). Human Kinetics

Appendix A

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Dato: 26.05.2008

Deres ref.:

Vår ref.: 08/282b

08/282b **Målorientering, motivasjonelt klima, de grunnleggende psykologiske behov og tegn på utbrenthet gjennom en sesong for yngre elitelangrensløpere: en lengdestudie**
Komiteen behandlet søknaden i sitt møte den 15. mai 2008. Prosjektet er vurdert etter lov om behandling av etikk og redelighet i forskning av 30. juni 2006, jfr. Kunnskapsdepartementets forskrift av 8. juni 2007 og retningslinjer av 27. juni 2007 for de regionale komiteer for medisinsk og helsefaglig forskningsetikk.

Saksframstilling

Formålet med prosjektet er å kartlegge målorientering, motivasjonelt klima, grunnleggende psykologiske behov og tegn på utbrenthet blant yngre langrensløpere på elitenivå.

Komiteens vurdering

Det kan i noen tilfeller være uklart hva slags prosjekter som skal defineres som medisinsk eller helsefaglig forskning og som derfor er fremleggelsespliktig for REK. Selv om man i dette prosjektet berører psykologiske forhold, involveres i utgangspunktet ikke pasienter, humant biologisk materiale eller helsedata knyttet til sykdom i normal forstand. Søker skriver blant annet at man ”gjennom dette studiet kan se hva som gjør at unge i dagens samfunn velger å holde på med en aktivitet.” (pkt. 9 i søknaden). Komiteens vurdering er derfor at prosjektet, som ikke synes å reise større forskningsetiske problemer, ikke oppfattes som medisinsk eller helsefaglig forskning.

Vedtak

På bakgrunn av overstående er komiteen kommet frem til at prosjektet ikke er fremleggelsespliktig jfr. komiteens retningslinjer for fremleggelsesplikt.

Komiteens avgjørelse var enstemmig.

Komiteens vedtak kan påklages (jfr. Forvaltningslovens § 28) til Den nasjonale forskningsetiske komité for medisin og helsefag. Klagen skal sendes til REK Sør-Øst B (jfr. Forvaltningslovens § 32). Klagefristen er tre uker fra den dagen du mottar dette brevet (jfr. Forvaltningslovens § 29). Det bes presisert hvilke vedtak/vilkår som påklages og den eller de endringer som ønskes. Se informasjon om klageadgang og partsinnsynsrett på <http://www.etikkom.no/REK/klage>

Med vennlig hilsen

Tor Norseth

Leder

Julianne Krohn-Hansen

Komitéssekretær

Appendix B

Forespørsel om deltakelse i forskningsprosjektet

Målorientering, motivasjonelt klima, de grunnleggende psykologiske behov og tegn på utmattelse og overtrening gjennom en sesong for yngre elitelangrensløpere.

Bakgrunn og hensikt

Dette er et spørsmål til deg om å delta i en forskningsstudie for å kartlegge motivasjon, motivasjonelt klima og mulige tegn på utbrenthet blant yngre langrensløpere på elitenivå. Du er valgt ut til å delta i dette studiet fordi du har prestert på et topp nasjonalt og/eller internasjonalt nivå, og fordi du sesongen 2008/2009 er tatt ut til å representere et landslag. Studiet har sitt utgangspunkt i to masterstudier ved Norges Idrettshøgskole, men det vil i sin form samle inn data som en studie. Det vil være et samarbeidsprosjekt mellom Norges Idrettshøgskole og Olympiatoppen.

Hva innebærer studien?

Dette studiet vil være basert på en spørreundersøkelse bestående av ca 100 spørsmål som det tar ca 10-15 minutter å svare på. For å kunne måle de ulike endringene gjennom en hel sesong vil undersøkelsen bli gjennomført 3 ganger. Selve undersøkelsen vil kunne gjennomføres ved en nettbasert skjematisk utfylling. Alle deltakere vil bli påminnet tidspunkt for utfylling via mail og/eller SMS. Etter nevnt påminnelse vil det være satt av en tidsperiode for utfylling, dette slik at alle deltakere fyller ut skjemaet innenfor samme tidsperiode.

Mulige fordeler og ulemper

Selve intensjonen med dette studiet er å kartlegge motivasjon, motivasjonelt klima og mulige tegn til utmattelse og overtrening gjennom en sesong for yngre elitelangrensløpere. Norges Skiforbund og de respektive team/skigymnas vil få tilbud om en presentasjon av de totale data fra studiet. Dette kan være til hjelp i fremtidig

satsning. Hver enkelt deltaker vil også få muligheten til å se sine egne resultater etter avtale med oss i prosjektgruppa. De ulemper vi kan se i forbindelse med dette studiet vil være den tid det tar for den enkelte å fylle ut selve skjemaene. Vi har prøvd å gjøre dette til en enklest mulig prosess der vi også tilrettelegger for elektronisk utfylling.

Hva skjer med informasjonen om deg?

Informasjonen som registreres om deg skal kun brukes slik som beskrevet i hensikten med studien. Alle opplysningene vil bli behandlet uten navn og fødselsnummer eller andre direkte gjenkjennende opplysninger. En kode knytter deg til dine opplysninger gjennom en navneliste. Listen over deltakere og deres deltakernummer vil bli lagret ved Norges Idrettshøgskole i et låst arkiv.

Det er kun autorisert personell knyttet til prosjektet som har adgang til navnelisten og som kan finne tilbake til deg. Det vil så langt som mulig søkes å publisere resultatene slik at identiteten til inkluderte ikke kommer frem.

Frivillig deltakelse

Det er frivillig å delta i studien. Du kan når som helst og uten å oppgi noen grunn trekke ditt samtykke til å delta i studien. Dette vil ikke få konsekvenser for din videre behandling. Dersom du ønsker å delta, undertegner du samtykkeerklæringen på siste side. Om du nå sier ja til å delta, kan du senere trekke tilbake ditt samtykke uten at det påvirker din øvrige behandling. Dersom du senere ønsker å trekke deg eller har spørsmål til studien, kan du kontakte Anne Marte Pensgaard på telefon 419 00365 eller Pierre-Nicolas Lemyre på telefon 23 26 24 22.

Vi håper flest mulig har tid og anledning til å være med!!

Med vennlig hilsen

.....

Frank Heggebø

.....

Dag André Nilsen

Samtykke til deltakelse i studien

Jeg er villig til å delta i studien

(Signert av prosjektdeltaker, dato)

Stedfortredende samtykke når berettiget, enten i tillegg til personen selv eller istedenfor

(Signert av nærstående, dato)

Jeg bekrefter å ha gitt informasjon om studien

(Signert, rolle i studien, dato)

Appendix C

Deltakernummer: _____

Variabler som påvirke motivasjon, utmattelse og overtrening gjennom en sesong hos yngre elitelangrensløpere

Gjennomføring

Dette er den tredje av totalt 5 gjennomføringer. Det er viktig for oss å understreke at du er velkommen til å delta selv om du ikke har deltatt tidligere. Undersøkelsen består totalt av 98 spørsmål som det tar ca 10-15 minutter å svare på. Skjemaet er delt inn i 2 hoveddeler. Første del består av noen generelle spørsmål om deg. Vi ber om at du svarer på denne delen om du ikke har fylt den ut tidligere, om dette er første gang du er med eller om du har endringer i dine fire hovedmål for sesongen. Andre del består av 8 forskjellige hovedspørsmål. Disse spørsmålene er knyttet til din rolle som langrensløper og til det miljøet du tar del i. Under hvert hovedspørsmål vil det være ulike utsagn med 5, 7 eller 10 svaralternativer. For hvert utsagn ber vi deg sette ett kryss på det alternativet som best beskriver hvordan du føler det. Det er ingen rette eller gale svar.

Litt informasjon om studien

Du er valgt ut til å delta i dette studiet fordi du har prestert på et topp nasjonalt og/eller internasjonalt nivå, og fordi du sesongen 2008/2009 er tatt ut på et landslag eller et privat finansiert rekrutteringslag. Studiet har sitt utgangspunkt i to masterstudier ved Norges Idrettshøgskole, men det vil i sin form samle inn data som en studie. Det vil være et samarbeidsprosjekt mellom Norges Idrettshøgskole og Olympiatoppen.

Vi minner om at all informasjon som registreres om deg kun skal brukes slik som beskrevet i tidligere skriv om denne studien. Alle opplysningene vil bli behandlet uten navn og fødselsnummer eller andre direkte gjenkjennende opplysninger. Ditt deltakernummer knytter dine opplysninger gjennom en navneliste. Listen over deltakere og deres deltakernummer vil bli lagret ved Norges Idrettshøgskole i et låst arkiv. Det er kun autorisert personell knyttet til prosjektet som har adgang til navnelisten og som kan finne tilbake til deg. Det vil så langt som mulig søkes å publisere resultatene slik at identiteten til inkluderte ikke kommer frem.

Det er frivillig å delta i studien. Du kan når som helst og uten å oppgi noen grunn trekke ditt samtykke til å delta i studien. Dette vil ikke få konsekvenser for din videre behandling. Om du har noen spørsmål til selve studiet eller ønsker å trekke deg, kan du kontakte Anne Marte Pensgaard på telefon 419 00365 eller Pierre-Nicolas Lemyre på telefon 23 26 24 22.

Del 1

- | | | | | | | | |
|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| | Mann | Kvinne | | | | | |
| 1. Kjønn | <input type="checkbox"/> | <input type="checkbox"/> | | | | | |
| | 17år | 18år | 19år | 20år | 21år | 22år | 23år |
| 2. Alder | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | 1-3år | 4-5år | 6-7år | 8-9år | 10-11år | 12-13år | 14- år |
| 3. Idrettslig alder
(Hvor lenge har du drevet organisert idrett) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | Verdenscup | Skandinavisk cup | Norges cup | Nordisk junior landskamp | Ungdoms OL | | |
| 4. Nivå
(Sett kryss på det høyeste nivået du har prestert) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | |
| | 400-500 | 500-600 | 600-700 | 700-800 | 800- | | |
| 5. Hvor mange timer har du planlagt å trene inneværende sesong? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | |

6. Hva er dine fire hovedmål for sesongen 08/09? (Besvares om dette er første utfylling eller om det er endringer i allerede innrapporterte mål)

a. _____

b. _____

c. _____

d. _____

Del 2

Denne delen består av 7 hovedspørsmål med flere underliggende utsagn. For hvert utsagn vil det være 5 eller 7 svaralternativer. For hvert utsagn nedenfor, sett ett kryss på det alternativet som best beskriver hvordan du føler det. Vi ber deg om å lese spørsmålene og alternativene nøye, og husk at det er ingen rette eller gale svar.

1. Hvordan vil du vurdere din vilje/forutsetning til å trene?

	helt enig			nøytral			helt uenig
	1	2	3	4	5	6	7
Jeg føler meg trygg på min evne til å trene	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Jeg mestrer det å trene	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Jeg vet hvordan jeg skal trene	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Jeg føler meg i stand til å møte utfordringer i forhold til det å trene	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2. Hva betyr suksess i langrenn for deg?

	helt enig	litt enig	nøytral	litt uenig	helt uenig
	1	2	3	4	5
11. Jeg slår andre	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. Jeg er helt overlegen	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. Jeg er den beste	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. Jeg gjør en god innsats	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. Jeg viser personlig fremgang	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. Jeg gjør det bedre enn mine konkurrenter	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. Jeg når ett mål	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18. Jeg overvinner vanskeligheter	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19. Jeg når mine personlige mål	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

- | | | | | | |
|---------------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 20. Jeg vinner | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 21. Jeg får vist andre at jeg er best | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 22. Jeg yter maksimalt | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

3. På det laget jeg tilhører så opplever jeg at:

- | | helt enig
1 | litt enig
2 | nøytral
3 | litt uenig
4 | helt uenig
5 |
|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 23. Utøverne har en god følelse når de gjør det bedre enn andre | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 24. Bare noen få utøvere kommer i søkelyset | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 25. Utøverne blir ”staffet” når de gjør feil | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 26. Det er viktig å gjøre det bedre enn de andre utøverne | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 27. Treneren vil at vi skal prøve ut nye ferdigheter | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 28. Bare den beste utøveren blir anerkjent/lagt merke til | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 29. Treneren gir mest oppmerksomhet til de beste utøverne | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 30. Innsats blir belønnet | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 31. Utøverne liker å måle seg opp mot andre flinke utøvere | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 32. Utøverne blir oppmuntret til å gjøre det bedre enn sine medkonkurrenter | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 33. Alle ønsker å bli best | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 34. Fremgang hos hver enkelt utøver er viktig | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 35. Det er viktig å gjøre det bedre enn de andre | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 36. Utøverne er redde for å gjøre feil | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 37. Treneren er opptatt av å utvikle/bedre ferdigheter | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | helt enig
1 | litt enig
2 | nøytral
3 | litt uenig
4 | helt uenig
5 |
| 38. Utøverne prøver å lære seg nye | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

ferdigheter

- | | | | | | |
|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 39. Treneren favoriserer enkelte utøvere | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 40. Utøverne blir oppmuntret til å trene på det de ikke er flinke til | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 41. Alle utøverne har en viktig oppgave | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

4. Hva er det som best beskriver årsaken til at du nå driver med langrenn?

- | | passer
helt
perfekt
7 | passer
veldig
bra
6 | passer
ganske
bra
5 | passer
moderat
4 | passer
litt
3 | passer
litte
granne
2 | passer
ikke i det
hele tatt
1 |
|---|--|--|--|--|---|---|---|
| 42. Fordi jeg synes at langrenn er interessant | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 43. Fordi jeg gjør det for min egen skyld | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 44. Fordi det er forventet at jeg skal gjøre det | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 45. Det er kanskje mange gode grunner for å gå langrenn, men personlig så ser jeg ingen | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 46. Fordi jeg synes at langrenn er behagelig / trivelig | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 47. Fordi jeg tror at langrenn er bra for meg | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 48. Fordi det er noe jeg må gjøre | <input type="checkbox"/>
passer
helt
perfekt
7 | <input type="checkbox"/>
passer
veldig
bra
6 | <input type="checkbox"/>
passer
ganske
bra
5 | <input type="checkbox"/>
passer
moderat
4 | <input type="checkbox"/>
passer
litt
3 | <input type="checkbox"/>
passer
litte
grann
2 | <input type="checkbox"/>
passer
ikke i
det hele
tatt
1 |
| 49. Jeg driver med langrenn, men jeg er ikke sikker på at det er verdt det | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 50. Fordi langrenn er | | | | | | | |

	artig / morsomt	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
51.	Fordi jeg har valgt det selv	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
52.	Fordi jeg ikke hadde noe valg	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
53.	Jeg vet ikke. Jeg ser ikke helt hva langrenn gir meg	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
54.	Fordi det føles godt å gå langrenn	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
55.	Fordi jeg mener at langrenn er viktig for meg	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
56.	Fordi jeg føler at jeg må gjøre det	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
57.	Jeg driver med langrenn, men jeg er ikke sikker på om det er riktig å fortsette	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

5. Se nøye på hver av påstandene, og tenk på hvordan dette passer for deg i treningen. Indiker på skalaen hvor sant disse er for deg.

		ikke sant i det hele tatt			noe sant			veldig sant
		1	2	3	4	5	6	7
58.	Treningen er i stor grad forenlig med mine valg og interesser	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
59.	Jeg føler sterkt at treningen passer måten jeg vil trene på	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
60.	Måten jeg trener på er helt klart et uttrykk for hvordan jeg ønsker at treningen skal være	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
61.	Jeg føler sterkt at jeg har mulighet til å gjøre valg i	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

- forhold til min aktivitet
62. Jeg føler jeg har stor fremgang i forhold til målet mitt med treningen
63. Jeg føler jeg utfører øvelsene i treningsprogrammet mitt veldig effektivt
64. Jeg føler denne treningen er noe jeg får til bra

- | | ikke sant i det hele tatt | | | noe sant | | | veldig sant |
|--|---------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 65. Jeg føler jeg kan klare de oppgavene treningsprogrammet legger opp til | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 66. Jeg føler meg veldig bekvem sammen med de andre på laget | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 67. Jeg føler jeg kan omgås de andre på laget på en vennlig måte | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 68. Jeg føler jeg har en god og åpen kommunikasjon med de andre på laget | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 69. Jeg føler meg veldig fortrolig med de andre på laget | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

6. I de følgende spørsmål skal du indikere hvor ofte du har hatt den nevnte følelse eller tanke i løpet av den siste tiden. 1 betyr: "Jeg har det nesten aldri sånn" og 5 betyr: "Jeg har det nesten alltid sånn".

nesten	sjelden	noen ganger	ofte	nesten alltid
1	2	3	4	5

70. Jeg utretter mange verdifulle ting langrenn	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
71. Jeg føler meg så sliten på grunn av treningen min, at jeg har problemer med å finne energien til å gjøre andre ting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
72. Den innsatsen jeg legger i langrenn kunne være brukt bedre på andre ting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
73. Jeg føler meg alt for sliten av å delta i langrenn	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
74. Jeg oppnår ikke mye i langrenn	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
75. Jeg bekymrer meg ikke på langt nær så mye om mine langrennsprestasjoner, som jeg gjorde tidligere	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
76. Jeg lever ikke opp til mine egne forventninger i langrenn	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
77. Jeg føler meg utslitt av langrenn	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
78. Jeg er ikke så engasjert i langrenn som jeg har vært tidligere	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
79. Jeg føler meg fysisk utslitt av langrenn	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
80. Jeg føler meg mindre bekymret om det å være suksessfull i langrenn en jeg har vært tidligere.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	nesten aldri 1	sjelden 2	noen ganger 3	ofte 4	nesten alltid 5
81. Jeg blir både mentalt og fysisk utmattet av kravene i langrenn	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
82. Det virker som om, at uansett hva jeg gjør, så er ikke prestasjonene mine så gode som de burde være	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
83. Jeg føler, at jeg har suksess i langrenn	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

84. Jeg har negative følelser overfor langrenn
85. Jeg har overskudd til å være sammen med familie og venner i fritiden

7. Her er noen spørsmål om hvordan du har følt deg i det siste:

86. Hvordan har energinivået ditt vært de siste 2 månedene?

Veldig sliten										Veldig energisk
1	2	3	4	5	6	7	8	9	10	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

87. Hvordan har du sovet i det siste?

Veldig dårlig										Veldig bra
1	2	3	4	5	6	7	8	9	10	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

88. Hvor sterkt har du følt for å trene i det siste?

Veldig lite										Veldig mye
1	2	3	4	5	6	7	8	9	10	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

89. Hvordan har matlysten din vært i det siste?

Liten										Stor
1	2	3	4	5	6	7	8	9	10	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

90. Hvordan har treningskvaliteten din vært i det siste?

Svært dårlig										Svært bra
1	2	3	4	5	6	7	8	9	10	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

91. Hvordan har arbeidsmengden din på skole/arbeid vært i det siste?

Svært liten										Svært stor
1	2	3	4	5	6	7	8	9	10	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

92. Hvordan er din økonomiske situasjon?

Veldig Bekymrings- full										Ingen bekymringer
1	2	3	4	5	6	7	8	9	10	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

93. Hvor mye har du reist i de siste 2 måneder?

Veldig lite										Mye
1	2	3	4	5	6	7	8	9	10	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

94. Hva har du følt om mennesker rundt deg i det siste?

Person(er) du lever med:

Svært irritert										Svært bra
1	2	3	4	5	6	7	8	9	10	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Treneren:

Svært irritert										Svært bra
1	2	3	4	5	6	7	8	9	10	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Lagkamerater:

Svært irritert										Svært bra
1	2	3	4	5	6	7	8	9	10	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Familien:

Svært irritert										Svært bra
1	2	3	4	5	6	7	8	9	10	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Andre: _____

Svært irritert										Svært bra
1	2	3	4	5	6	7	8	9	10	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

95. Har du hatt støle muskler i det siste?

Veldig støle										Ikke støle i det hele tatt
1	2	3	4	5	6	7	8	9	10	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

96. Har du vært småsjuk i det siste (f. eks. tett i nesa, sår hals, hoste, mageproblemer etc.)?

Aldri										Svært ofte
-------	--	--	--	--	--	--	--	--	--	------------

1	2	3	4	5	6	7	8	9	10
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

97. Har du hatt noen belastningsskader i det siste (f. eks. senebetennelse, tretthetsbrudd)?

Ja	Nei
<input type="checkbox"/>	<input type="checkbox"/>

Dersom ja; har dette stoppet deg fra å trene normalt?

Ja	Nei
<input type="checkbox"/>	<input type="checkbox"/>

8. I det neste spørsmålet skal du svare ved å sette ett kryss på det alternativet du føler passer best for deg.

	Verdensklasse	Internasjonalt nivå	Nasjonalt nivå	Middels nasjonalt nivå	Lavt i forhold til andre
Hvor god føler du at du er i					
98. langrenn?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Takk for at du tok deg tid til å besvare spørsmålene!!

