

Examining Possible Relationships between Self-Determination and Burnout among Junior Athletes in Sport

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Abstract

Junior athletes often work hard to become elite athletes. In their career they will meet a range of potential loads that they must overcome in order to reach their fully potential. Sometimes the total load becomes too much to cope with and burnout could be one consequence. In the present investigation 483 junior athletes from seven different schools for elite sports were invited to partake in an online survey of which 382 athletes responded (79%). We tested whether need satisfaction was a predictor for burnout utilizing structural equation modeling, and as hypothesized, basic needs were negatively related with burnout. Hence, for this investigation it seemed that environments that satisfy the need for autonomy, competence and relatedness might help elite youth athletes to avoid burnout. The results are discussed in regard of applied implications and possible future research.

Keywords: self-determination, need satisfaction, athlete burnout, junior athletes

Received January 7, 2015

Revised June 6, 2015

Accepted June 20, 2015

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Introduction

Coaches and athletes in elite sports are constantly experimenting, whether consciously or not, by testing how much training loads athletes can manage to effectively develop their potential within sports. Junior athletes are normally required to undertake education as well alongside sports training (Cosh & Tully, 2014; Holt & Dunn, 2004). Training, work with school and exams, potential lack of progress in sport and/or at school, and social hassles are some potential loads junior athletes will meet on their path towards elite sports (Gustafsson, Kenttä & Hassmén, 2011). An optimal balance between training-, school-, and emotional loads and regeneration and recovery, are important to develop junior athletes toward elite sports. However, it might come a point when the loads are too many and/or too intense and athletes are likely to suffer from the maladaptive experience that is known as athlete burnout (Gustafsson, Hassmén, Kenttä & Johansson, 2008; Smith, 1986). Athlete burnout is an experiential state characterized by emotional and physical exhaustion, devaluation of sport participation, and a reduced sense of accomplishment (Lemyre, Roberts & Stray-Gundersen, 2007).

Interestingly, loss of motivation is an important feature that describes athletes with the burnout syndrome (Cresswell & Eklund, 2007; Lie et al., 2013). Thus, there seems to be a potential relationship between intrinsic motivation and athlete burnout. One recognized theory in the field of motivation is self-determination theory (Deci & Ryan, 2002). Self-determination theory highlights the importance of satisfying basic needs such as autonomy, competence and relatedness to stimulate intrinsic motivation (Deci & Ryan, 2002). Environments that support versus thwart these needs should invariantly impact intrinsic motivation. Interestingly, several studies show that the basic needs predict athlete burnout negatively (Li, et al., 2013). However, to our knowledge, no studies have investigated the relationship between need satisfaction and athlete burnout among junior athletes attending high schools specialized for sports in Norway. Athletes who start at such specialized schools are normally motivated for their sports, and then also in danger of developing athlete burnout since only highly motivated athletes can burn out (Lemyre et al., 2007). The purpose of this study is therefore to explore relations between need satisfaction and athletes' burnout among Norwegian junior athletes who are attending high schools specialized for sports.

Theoretical background

The definition of athlete burnout derives from the predominant conceptualization of burnout employed in the human service and organizational psychology literature (e.g., Maslach & Goldberg, 1998; Maslach, Jackson & Leiter, 1996; Maslach, Schaufeli & Leiter, 2001). Based on this framework, athlete burnout is a multidimensional construct that consists of three central dimensions: 1) emotional and physical exhaustion, 2) reduced sense of accomplishment, and 3) sport devaluation (Raedeke & Smith, 2001, 2009). Emotional and physical exhaustion is the most obvious manifestation of burnout and is characterized by feelings of emotional

and physical fatigue stemming from the psychosocial and physical demands associated with training and competing (Raedeke & Smith, 2001). This dimension is associated with the loads from intense training and competitions. A reduced sense of accomplishment is characterized by feelings of inefficacy and a tendency to evaluate oneself negatively in terms of sports performance and accomplishments (Raedeke & Smith, 2001). This dimension is related to skills and abilities, and athletes who are experiencing this phenomenon are unable to achieve personal goals or they perform below expectations. Sport devaluation is defined as a negative, detached attitude toward the sport, reflected by a lack of concern regarding the sport itself and the athlete's performance quality (Raedeke & Smith, 2001). Thus, athlete burnout is viewed as an experiential state observed from an athlete's perspective.

A 25-year review of the burnout literature shows that motivational symptoms such as lack of enthusiasm, depressed mood and feeling helpless are associated with the burnout construct (Schaufeli & Buunk, 2003). These symptoms are observed in sports and are found to have implications for an athlete's performance (Goodger, Gorely, Lavalle, & Harwood, 2007). A number of theories and models have been used to better understand the nature of athlete burnout in order to prevent it (Goodger et al., 2007; Smith, 1986). Athlete burnout is in general explained by insufficient recovery and regeneration (Kallus & Kellmann, 2000; Kentta & Hassmen, 1998; Tenebaum, Jones, Kitsantas, Sacks & Berwick, 2003). Even though the different models and theories have contributed to explain the nature of athlete burnout, the athlete burnout syndrome is still not fully understood and further research is needed (Li, Wang, Pyun & Kee, 2013).

Since the earliest accounts of burnout, there has been nearly unanimous agreement that burnout is a cognitive, emotional and physical reaction to stress, characterized by high levels of exhaustion resulting from the chronic demands made on an athlete's resources (Cresswell & Eklund, 2006; Raedeke & Smith, 2009). Stress is conceived as an imbalance between the person-environment relationships (Lazarus, 1991, 1999, 2000). When athletes are exposed to demands in the environment they engage in an evaluation to decide whether the environment has endangered or has the potential to endanger their personal goals or well-being (Aldwin, 2007; Nicholls, Perry & Calmeiro, 2014). If the situation is appraised to endanger personal goals or well-being, it is regarded as stressful (Nicholls, et al., 2014). Primary appraisal is a situation that is assessed to be a threat, harm or loss, or a challenge to the individual (Lazarus, 1999). Secondary appraisal involves determining whether one has the ability or the psychological resources to cope with the demand (Lazarus & Folkman, 1984). The manner in which a situation is appraised, such as threat, harm or challenge, and the evaluation of available coping resources in large part determines coping options and the strength and quality of the emotional reaction. Hence, the mere presence of a stressor, such as a competition in sport, is not necessarily predictive of negative stress. It is the perception and the meaning construction of the stressor that is significant (Lazarus, 2000).

To reach an elite level in sport is physically and psychologically highly demanding and athletes need to train and cope over a number of years in order to achieve their maximum performance level (Ericsson, 2006; 2007). Up to a certain point stress is beneficial in the way that as a result from stress athletes perform with

greater energy and increased awareness (Lazarus, 2000; Selye, 1976). Eustress is defined as positive stress that motivates athletes to continue their work (Lazarus, 2000). However, distress is negative and develops when the good stress becomes too much to cope with for an athlete (Lazarus & Folkman, 1986). Thus, if the athlete does not have the ability or the psychological resources to cope with the demand, distress will be the result. In order to avoid maladaptation and ultimately athlete burnout, all possible stressors must be considered in combination with the training load itself (Cresswell, 2009; Gustafsson, et al., 2011).

Historically physiological stress is considered to be the main antecedent to underperformance and exhaustion within sports (Kuipers & Keizer, 1988; Lazarus, 2000; Morgan, Brown, Raglin, O'Connor, & Ellickson, 1987). Athlete burnout research has on the other hand its focus on psychosocial stressors (Cresswell & Eklund, 2005; Lemyre, Treasure, & Roberts, 2006; Raedeke, 1997). Although the etiology of burnout is yet not fully clear, the majority of burnout-research has adopted a stress perspective with a focus on both antecedents and symptoms (Black & Smith, 2007; Goodger, et al., 2007; Gustafsson & Skoog, 2012; Jøuper & Gustafsson, 2013; Raedeke & Smith, 2001, 2004). The psychological process that underpins the coping process is therefore claimed to influence athlete burnout (Raedeke & Smith, 2009). However, while research traditionally has viewed motivation only in terms of progress or obstacles in the goal striving process, research also include the examination of volition and self-determination in goal striving as well (Ntoumanis, Edmunds & Duda, 2009). The motivational processes involved in the coping process necessitate the examination of volition and self-determination in goal striving. Interestingly, research has found interesting relationships between environments that thwart need satisfaction and the development of distress (Sapolsky, 2004).

Self- determination Theory

Self-determination theory (SDT) is found to be useful in demonstrating the role of volition and self-determination in the coping process (Deci & Ryan, 1985, 2002). Deci and Ryan (1985, p. 8) define intrinsic motivation as the life force or energy for the activity and for the inward pursuit to feel competent, self-determining and to enjoy the activity. Human functioning is viewed in terms of an active, integrative organism that requires certain nutrients to function optimally (Weinstein & Ryan, 2011). SDT is a macro-theory comprising of the five mini-theories cognitive evaluation theory, organismic integration theory, causality orientations theory, basic psychological needs theory and goal contents theory (Deci & Ryan, 2000). The different theories were developed to explain different facets of motivation and possible impact on physical, psychological, and emotional functioning.

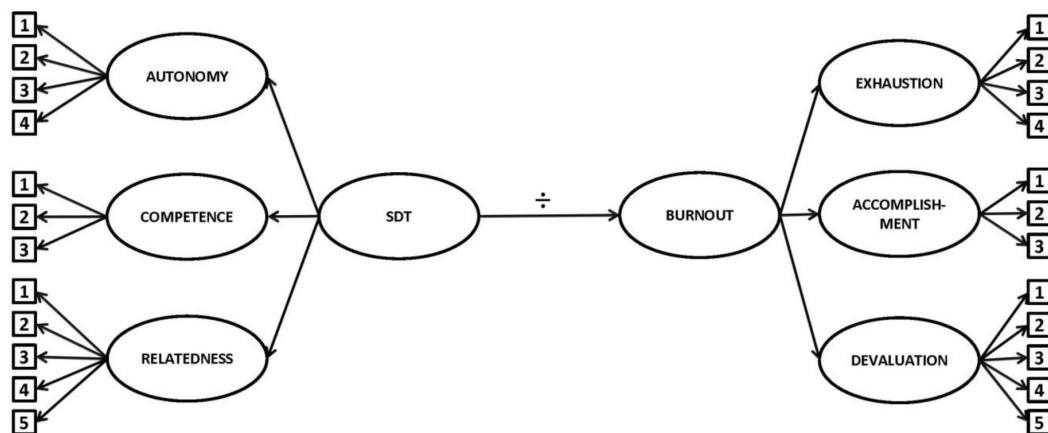
Deci and Ryan (2002) argue for the existence and the importance of the basic psychological needs, autonomy, competence and relatedness, as important nutrients in an athlete's environment in order to achieve personally growth and development through intrinsic motivation (Li, et al., 2013; Lonsdale, Hodge & Rose, 2009; Ryan, Huta & Deci, 2008). The need for competence refers to the general feeling of functioning effectively in one's social and achievement environment, it highlights the importance of experiences, or the lack of experiences, where the athlete has the opportunity to optimally utilize and display his or her strengths

and capacity (Deci, 1975; Harter, 1983; White, 1959). The need for self-determination, or autonomy, refers to an athlete's perception or understanding of being the source to, or origin of the achievement behavior (De Charms, 1968; Deci & Ryan, 1985; Ryan & Connell, 1989). Self-determination implies that actions originate from the athlete's own interests and values and emanate from personal initiative. The need for relatedness highlights the feeling of connectedness and attachment to other people in the environment. It carries a dual view that the athlete is taking care of others and that others are caring for the athlete (Baumeister & Leary, 1995; Bowlby, 1979; Ryan, 1995). Thus, in order for athletes to proactively engage in their own learning and development, intrinsic motivation is a desirable component of achievement pursuits.

The basic psychological needs remove comma after theory has been used to examine athlete burnout (Quested & Duda, 2011). Interestingly, this research indicated a relationship between need satisfaction and athlete burnout (Cresswell & Eklund, 2007; Gustafsson, et al., 2011; Lemyre, et al., 2007), and that self-determination theory can contribute to fully explain athlete burnout (Li, et al., 2013). According to the SDT, the three basic psychological needs autonomy, competence and relatedness, are all hypothesized to predict athlete burnout negatively (Deci & Ryan, 2000). Interestingly, a recent meta-analytic study that investigates the relationship between SDT and athlete burnout, shows that the three basic psychological needs negatively influenced global burnout and each of the three burnout dimensions (Li, et al., 2013). Thus, recent research indicates that the basic psychological needs theory is an important mini theory to explain the mechanisms of athlete burnout.

The purpose of the present study is to test our theoretical model of relations between need satisfaction and athletes' burnout among Norwegian junior athletes in sport who attend to high schools specialized for sports. Research claims that need satisfaction predicts athlete burnout negatively, and that it is the athletes' needs to be self-determined in their coping process that is the origin for this relationship (Li, et al., 2013). We expect that need satisfaction predicts athlete burnout and each of the dimensions of athlete burnout negatively. The model is shown in Figure 1.

Figure 1. Theoretical model of the relations between the constructs



Method

Participants and procedure

Four hundred and eighty three junior athletes from seven different Norwegian high schools for elite sports were invited to voluntarily participate in an online questionnaire measuring psychological variables such as need satisfaction and athlete burnout. The schools are specialized for elite sports and the athletes have to document both talent and ambitions to start at these schools. Thus, the athletes in this study have ambitions to develop their potentials at elite senior level and were from different sports such as cross country skiing, biathlon, Nordic combined, shooting, ice-hockey, ski jumping, alpine skiing, cycling, track and field, football, orienteering, handball and volleyball. Training is on the schedule at school every day of the week and the athletes normally train after school some of the days during weekdays and in the weekends. From these 483 participants, 382 (216 males and 166 females) completed the data collection, which gives a response rate of 79%. The sample had a mean age of 18 ½ years, ranging from 17 to 20 years.

The general variables. The variables examined here include items and inventories such as age, gender, type of sport, performance level, type of school, need-satisfaction and athlete burnout. All measurements used in this study were based on previously developed scales proven to hold both satisfactory validity and reliability. The measurements were originally in English and they were therefore translated into Norwegian and slightly adjusted for the purpose of this study by the authors.

Self-determination. Since the concept of the basic psychological needs is central to self-determination theory, we developed an instrument based on the most often implemented tool used for this study, namely the Basic Psychological Need Satisfaction at Work Scale (BPNSWS) (Baard, Deci & Ryan, 2004). The instrument is originally a 21 item questionnaire measuring three need satisfaction dimensions. The authors translated the instrument and adjusted the measurement for sports, but reduced it into a 12 item questionnaire in order to insure optimal reliability, consisting of autonomy (4 items), competence (3 items) and relatedness (5 items). The reduction in number of items was based on exploratory factor analyses (EFA). Results from EFA using Maximum Likelihood estimation with both Oblimin and Varimax rotation indicated that a fewer number of items on the subscales probably would contribute to a more parsimonious model. The problem may have occurred during the translation from English to Norwegian and in the adaptation of the instrument to sport. For the sake of clarity, we named it the Reduced Need Satisfaction Scale (RNSS). The participants were asked to consider their feelings about their training during the last year and to indicate how true the 12 statements were on a seven point scale. Examples of items are: “I feel like I can make a lot of input in deciding how my training gets done” (autonomy), “Coaches and athletes in my team tell me I am good at what I do” (competence) and “I really like the other athletes that I train with” (relatedness). The reliability for each dimension were .76, .65 and .90 respectively.

The Athlete Burnout Questionnaire. In order to insure an optimal reliability we developed a reduced version of the Athlete Burnout Questionnaire (ABQ), and translated it into Norwegian using a double-translation-back-translation technique (Raedeke & Smith, 2009). The stem for each question was “How often do you feel this way?” Athletes were requested to rate the extent to which the items address their participation motives on a five-point Likert scale anchored by (1) “Almost Never” and (5) “Almost Always”. The original ABQ has three five-item subscales assessing the three key dimensions of burnout: (1) a reduced sense of accomplishment, (2) emotional and physical exhaustion, and (3) devaluation of sports participation. Our reduced version had 3, 4 and 5 items respectively. As with the scales measuring self-determination, initial exploratory factor analyses were employed to gain a more parsimonious model. Examples of items covering these dimensions are respectively: “It seems that no matter what I do, I don’t perform as well as I should”, “I feel so tired from my training that I have trouble finding energy to do other things”, and “I have negative feelings toward sports”. The reliability for each dimension was .79, .79 and .79.

Data analysis

The data were analyzed by means of confirmatory factor analysis (CFA) and structural equation modeling (SEM) using the AMOS 21 program. We first tested a measurement model of the constructs by means of CFA. Secondly, we explored relations between the variables by means of structural equation modeling (SEM). SEM is a statistical methodology that takes a confirmatory approach to the analysis (Byrne, 2010). In this approach, a hypothesized model of the relations between the constructs is tested statistically to determine the extent to which it is consistent with the data, which is referred to as the goodness of fit. If the goodness of fit is adequate, the plausibility of the proposed relations among the constructs is supported. To assess the model fit, we used well-established indices, such as CFI, IFI, TLI, and RMSEA, as well as the chi-square test. For the CFI, IFI, and TLI indices, values greater than .90 are typically considered acceptable, and values greater than .95 indicate a good fit of the data (Byrne, 2010; Hu & Bentler, 1999). For well-specified models, an RMSEA of .06 or less reflects a good fit (Hu & Bentler, 1999; Tabachnick & Fidell, 2007).

Results

Correlations and descriptive statistics

Table 1 shows the correlations between the study variables as well as the possible maximum possible scores, statistical means, standard deviations, and Cronbach’s alphas.

Table 1. Pearson correlations and descriptive statistics of the study variables

Variable	1	2	3	4	5	6
1. Autonomy	-					
2. Competence	.620**					
3. Relatedness	.633**	.700**				
4. Exhaustion	-.226**	-.190**	-.226**			
5. Accomplishment	-.277**	-.329**	-.260**	.337**		
6. Devaluation	-.221**	-.280**	-.260**	.350**	.485**	-
Maximum possible score	28.00	21.00	35.00	20.00	15.00	25.00
Number of items	4	3	5	4	3	5
Mean	20.70	16.42	29.46	9.92	8.00	10.41
Standard deviation	4.22	2.73	5.08	3.05	3.02	4.12
Cronbach's alpha	.76	.65	.90	.79	.79	.79

Note. * $p < .05$, ** $p < .01$, *** $p < .001$. The estimates are based on the observed data.

The zero order correlations between the study variables vary from zero (+/- .01 to .19) to strong (+/- .40 to .69) positive and negative relationships. The Cronbach's alphas of the variables in this study varied from excellent to acceptable. One approach that is used to interpret burnout scores is to develop norms by dividing the distribution into thirds with scores in the upper third defined as high burnout, those in the middle third as average burnout, and those in the bottom third reflecting low burnout (Raedeke & Smith, 2009). The mean scores in this investigation are found to be average burnout (in the middle third) compared to Raedeke and Smith's (2009, p.51) data collection of burnout scores and distribution into thirds. However, the mean score for accomplishment is between average and high burnout.

Measurement model

To investigate the measurement model and the relations between the variables we initially conducted a confirmatory factor analysis of the latent variables. None of the error variances in the model was allowed to correlate. The model had good fit to data (χ^2 (237, $N = 382$) = 521.598, $p < .001$, CMIN/DF = 2.201, RMSEA = 0.056, IFI = 0.929, TLI = 0.916, and CFI = 0.928), and all regression weights in the model were significant at $p < .001$. Supporting the zero-order correlations (see Table 1) the correlations between the latent variables varied from low to moderate/strong (see Table 2). The result from the CFA supports the conceptualization of six separate but moderately to strong correlated constructs.

Table 2. Correlations between the latent variables in the model

Variable	1	2	3	4	5	6	7
1. Autonomy	-						
2. Competence	.872***	-					
3. Relatedness	.790***	.890***	-				
4. Exhaustion	-.295***	-.255***	-.267***	-			
5. Accomplishment	-.339***	-.460***	-.309***	.398***	-		
6. Devaluation	-.336***	-.424***	-.319***	.370***	.611***	-	

Note. * $p < .05$, ** $p < .01$, *** $p < .001$

Structural model

We tested the theoretical model displayed in Figure 1 by means of structural equation modeling. In the model specification, none of the error variances were allowed to correlate. The model had acceptable fit to the data (χ^2 (246, $N = 382$) = 531.336, $p < .001$, $CMIN/DF = 2.160$, $RMSEA = 0.055$, $IFI = 0.928$, $TLI = 0.919$, and $CFI = 0.928$). Estimates of the standardized regression weights and the squared multiple correlations are shown in Figure 2, whereas unstandardized regressions weights, standard errors, total effects, and indirect effects are presented in Table 3. Since AMOS doesn't provide standard errors (SE) and confidence intervals (CI) for all estimates, a bootstrap analysis was performed to estimate approximate SE and CI for the total and indirect effects. The bootstrap method is a versatile method for estimating the sampling distribution of parameter estimates.

Figure 2. Structural model of the relations between the constructs

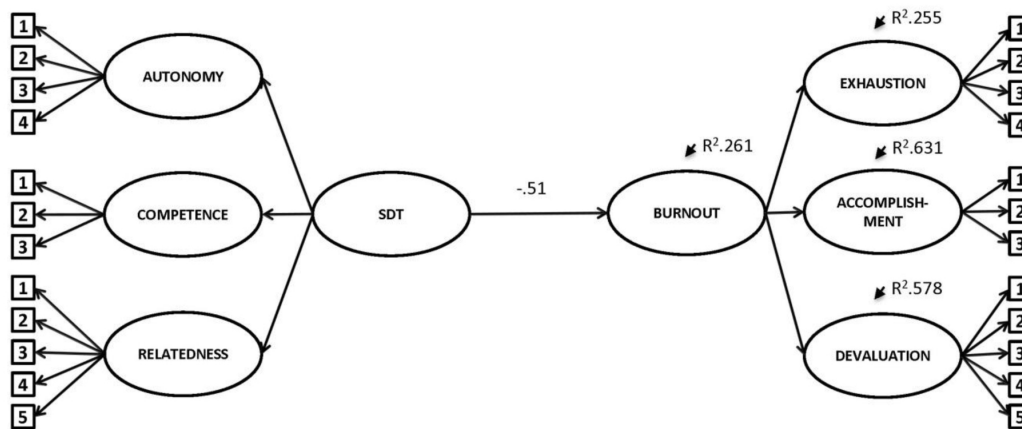


Table 3. Summary of SEM analysis of the theoretical model

Latent variable	Unstandardized		Standardized	Standardized
	weights	SE	total effect	indirect effect
Burnout				
Self-determination	-.389***	.063	-.511	-
^a Exhaustion				
Self-determination	-.188***	.057	-.258	-.258
^a Accomplishment				
Self-determination	-.389***	.049	-.406	-.406
^a Devaluation				
Self-determination	-.238***	.049	-.389	-.389

Note. *** $p < .001$.

^aTests of significance (indirect effects) estimated by bootstrap (2000 samples).

Discussion

Actions that can prevent burnout among junior athletes are important since burnout inhibit regeneration and development of athletes' potential. Interestingly, environments that support the basic psychological needs proposed by Deci and Ryan (2000) are found to be important for optimal functioning in the sport setting (Quested & Duda, 2011). One purpose of the present study was to examine the potential relationships between need satisfaction and athletes' burnout among Norwegian junior athletes attending high schools specialized for sports. The findings with our sample of high-level junior athletes seemed to corroborate with previous research in that psychological needs from a self-determination theory standpoint related to burnout scores (Bartholomew, Ntoumanis, Ryan, Bosch & Thøgersen-Ntoumani, 2011; Bartholomew, Ntoumanis & Thøgersen-Ntoumani, 2011; Li, et al., 2013; Quested & Duda, 2011). In particular, we found that need satisfaction was negatively related to burnout scores, a finding that also was in accordance with our predictions.

One possible explanation of our results is the coping process athletes need to be involved in when they meet challenges on their path towards elite sports. These athletes are potentially struggling with loads from both their sport, school and socially, and might struggle to find the balance between loads, regeneration and recovery (Gustafsson et al., 2011). The need for competence refers to an athlete's perception that he or she is able to be effective in his or her sport (Lonsdale, Hodge & Rose, 2009). Thus, the need for competence is related to the coping process and athletes need to experience that they utilize and display strengths and capacities in their natural sports environment. The young Norwegian athletes in this study have decided to start at high schools specialized for sports where they need to train every day at

school, often after school and normally in weekends. The athletes often meet situations where they need to utilize and display their capacities and are well aware of that only a few will become future elite athletes in their sports. When these athletes experience that they are not able to be effective in their sports environment it might soon become an imbalance between the person-environment relationship as proposed by Lazarus (2000). As a consequence, motivated and ambitious athletes might evaluate that the environment endanger their personal goals or well-being, and the situation will then be regarded as negative stress (distress) (Lazarus & Folkman, 1986; Nicholls, et al., 2014). However, on the other hand, if athletes experience that they are able to be effective in the sport setting, and the need for competence is satisfied, the situation will not endanger personal goals or well-being and therefore have the potential to prevent athlete burnout. The stress will then be regarded as a positive stress (eustress) and motivate athletes to continue their work (Lazarus & Folkman, 1986). Earlier research support this relationship, whereas competence is found to be a significant predictor of athlete burnout (Hodge et al., 2008; Perreault et al., 2007).

The need for autonomy refers to actions that originate from the athlete's own personal interest, initiative or values. Autonomous athletes are found to have several beneficial strategies when they are faced with challenges (Weinstein & Ryan, 2011). Weinstein and Ryan (2011) advocated that autonomous people have more interest in their experiences with loads that create stress and that such situations will stimulate curiosity and learning. This in turn will help athletes to build a repertoire of coping responses that preserves flexibility to adapt to different situations. When curiosity and learning are stimulated, athletes should be better to focus on their capabilities in their coping process and not devalue their work. Park and Folkman (1997) argue that autonomous motivation is related with more active and adaptive forms of coping, rather than defense. Recent research also found that athlete-centered coaching stimulates athletes' need satisfaction (Moen & Federici, 2014). Thus, autonomous athletes have the potential to process their learning to a fuller extent, which will improve their opportunities to create meaning and be better prepared for similar situations in the future (Weinstein & Ryan, 2011). As a result, autonomous athletes respond more offensive to potential loads as they interpret them as challenges (eustress) rather than threats (distress). Thus, autonomous athletes are better to create meaning when faced with challenges and should be able to develop better and more beneficial coping skills. Taken together, autonomous motivated athletes will grant better control over the situation, as athletes can decide what to do based on personal judgments, rather than being depended on others or external factors. In order to help the athletes' progress, coaches, teachers and parents are advised to help athletes reflect upon previous experiences so that they learn from their previous struggles. Interestingly, earlier research also show that autonomy is a significant predictor of athlete burnout (Hodge, Lonsdale & Ng, 2008; Perreault et al., 2007).

The need for relatedness refers to an athlete's feeling of connectedness and attachment to others in the sport environment. Research claims that athletes in an environment that triggered caring and personal improvement relative to a climate that emphasized social/normative comparison stimulated significantly less

anxiety, stress and shame (Hogue, Fry, Fry & Pressman, 2013). Thus, environments that stimulate the need for relatedness should have the potential to reduce a potential imbalance between the person-environment relationship. This might be a struggle in junior environment in sports where athletes are competitive and struggle to become elite athletes (Gould, Tuffey, Udry & Loehr, 1997). More research is needed, although the study by for instance Hogue and colleagues (2013) demonstrates that the motivational surroundings may have a bearing on the physiological factors of stress. Evidently, coaches are advised to foster environments that emphasize the satisfaction of psychological needs by involving them in their coping process (Lepore, Ragan & Jones, 2000). Interestingly, the involvement process itself has the potential to influence the need for relatedness positively (Moen, 2010). Perreault and colleagues (2007) have found that athlete-coach relatedness is a significant predictor of all three burnout symptoms.

Our results show that need satisfaction is more predictive on the burnout dimensions accomplishment and devaluation compared to exhaustion (Figure 2). Lemyre and colleagues (2006) suggested that devaluation is the most cognitive of the burnout dimensions, and that accomplishment and devaluation are the most predictive motivational aspect of burnout. Accomplishment is related to the coping process and thus links it to both the need for competence and autonomy. Exhaustion is claimed to be more strongly influenced by physical factors (Lemyre et al., 2006). Interestingly, our results also show that exhaustion is less predictive by need satisfaction.

In order to help aspiring athletes to develop, the total [stress] load should also be taken into consideration. Being a student, training, and maybe having a part time job (i.e. high total load) might lead to an excessive stress load that eventually could lead to straining and burnout. In their study Kristiansen, Abrahamsen and Stensrud (2012) found a relationship between indicators of asthma and perfectionism, meaning that rigid goals (being perfectionistic) may also be related to debilitating effects. Perfectionistic predispositions is in some ways analogous to less autonomous forms of motivation in that one has to meet a certain performance criteria. Future research could also investigate whether perfectionistic tendencies moderates the relationship between need satisfaction and burnout. Also Lemyre and colleagues (Lemyre, Treasure & Roberts, 2006) reported a relationship between changes in motivation, burnout susceptibility and hormonal responses. In order to help athletes avoid being burned out, coaches, parents and teachers should help young aspiring athletes to monitor their total load, and make long-term plans that consider athletes' need for recuperation. Future studies should investigate how coaches influence the burnout syndrome, include a stress measure and follow the applied advice and monitor athletes over time. Longitudinal studies give the opportunity to examine the ebb and flow of stressors, emotions and performance as these fluctuate. Future studies might also investigate different age groups to determine if there are any critical ages that coaches, parents, and teachers should be extra careful helping the athletes.

Another important line of future research would be to determine what loads are more likely to cause problems for athletes. The findings of the present study give important theoretical and practical implications

and future examinations should replicate the present study with different samples.

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