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The relationship between burnout and mood state among student rugby union players

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Abstract

Mood state changes are widely regarded as a symptom of athlete burnout and show potential to be used as a marker for this condition. The aim of this study was to determine whether changes in burnout scores would be accompanied by similar changes in mood state scores, and to determine the strength of the relationship between burnout and mood state scores at different test points. Forty-one male student rugby union players (mean age: 22.26 ± 1.39 years) completed the Athlete Burnout Questionnaire (ABQ) of Raedeke and Smith (2001) and the Stellenbosch Mood Scale (STEMS) of Terry, Potgieter and Fogarty (2003) on a three-weekly basis over a five-month pre-season training, pre-competition and competition phase. Data collection consisted of seven test points in total during this period. The ABQ subscale scores remained unchanged throughout the study period, whereas practical significant fluctuations in *Total Mood State, Depressive Mood, Anger, Fatigue* and *Confusion* were evident. Practical significant correlations (relationships) were observed between various *Burnout* and *Mood State* subscales, notably at test points T_1 (start of the pre-season training phase), T_4 and T_5 (pre-competition phase). The *Emotional/Physical Exhaustion* and *Total Burnout Score* in particular were strongly related to various STEMS subscales. However, the strength of the burnout - mood state relationship was inconsistent over the study period. Collectively, these results raise question marks over the use of mood state changes as a marker for burnout in this particular group. Practitioners are, therefore, cautioned against the isolated use of mood state changes as a marker for burnout.

Keywords: Emotional, physical exhaustion, fatigue, marker, sign, symptom.

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Introduction

Rugby union coaches, sport scientists, sport psychologists, sports medicine personnel and the players themselves are concerned about the growing prevalence of burnout within this sport (Cresswell & Eklund, 2003). Not only has burnout been documented to have a detrimental effect on sport performance, but also on the well-being of the athletes (Raedeke & Smith, 2004; Cresswell & Eklund, 2005a).

Smith (1986: 39) defined athlete burnout as "a psychological, emotional and at times physical withdrawal from a formerly pursued and enjoyable activity in response to excessive stress or dissatisfaction". Gould (1997) also linked the negative influence of burnout on the quality of sport experiences to the discontinuation of sport. However, not every dropout in sport can be attributed to burnout (Gould & Dieffenbach, 2002). According to Gould and Whitley (2009) chronic stress (a perceived or actual imbalance between what is expected of an athlete physically, psychologically and socially and their response capabilities) causes burnout. It is important to note that both training- related physical overload and non-training related stressors contribute to athlete burnout (Goodger, Lavallee, Gorely & Harwood, 2010).

Over the years a number of stress-induced perspectives have been postulated, attempting to explain the causes of burnout and to provide a better understanding of the development thereof. Smith's (1986) cognitive-affective stress model, Silva's (1990) negative training stress response model and Kellmann's (1997) "scissors model" of the interrelation of stress states and recovery demands all focus on the role of physical stressors in the development of burnout. Kenttä and Hassmén's (1998) recovery-stress interaction model highlight the role of physical, psychological and social stressors, the capacity to handle these stressors, as well as physical, psychological and social recovery activities in the onset and development of athlete burnout. Whilst stress-induced burnout perspectives remain popular other approaches have also been proposed.

Coakley (1992) alluded to the influence of the social structure of high performance sport in his uni-dimensional identity and external control model. Cresswell and Eklund's extensive research (2003; 2004; 2005a; 2005b; 2006) on athlete burnout incorporated a motivational perspective, based on the self-determination theory of Deci and Ryan (1985). Their research on rugby players suggests that burnout is the result of chronically perceived unfulfilled basic needs (i.e., the need for autonomy, competence and relatedness).

Recently, the focus has been on the effect of maladaptive forms of perfectionism on the development of the burnout syndrome. Appleton, Hall and Hill (2009) demonstrated a significant positive association between socially prescribed perfectionism and burnout, as well as a significant negative association between self-oriented perfectionism and burnout among elite junior athletes. Furthermore, Hill, Hall, Appleton and Murray (2010) suggest that validation seeking may be an important psychological factor in the development of burnout among athletes exhibiting high levels of socially prescribed perfectionism. Different coping tendencies also seem to underpin the relationship between self-oriented and socially prescribed dimensions of perfectionism and athlete burnout (Hill, Hall, & Appleton, 2010).

It is foreseen that social, motivational and perfectionism perspectives will play an important role in our future understanding of this syndrome, without negating the contribution of physical, psychological and social stressors and recovery activities in this regard.

Most of the recent burnout perspectives have been tested against Raedeke's (1997) conceptualisation of athlete burnout. Elaborating on the work of Christina Maslach, the pioneer on burnout research within the human services domain, Raedeke (1997) conceptualised athlete burnout as a psycho-social syndrome, characterised by (i) a reduced sense of accomplishment (in terms of skills/abilities and the inability to achieve personal goals/ live up to expectations), (ii) sport devaluation (a loss of interest, a "don't care" attitude and resentment), and (iii) emotional and physical exhaustion (associated with intense training and competition). Within this conceptualisation Raedeke and Smith (2001) developed and validated the Athlete Burnout Questionnaire (ABQ), which has become the preferred instrument for research on this syndrome over the past decade.

A syndrome refers to a group of signs and symptoms that occur together and characterise a particular abnormality (Shirom, 2005). In this regard Gould, Tuffey, Udry and Loehr (1997) noted that burnout involves a broad spectrum of symptoms as well as shared symptomatology with related conditions (i.e. anxiety and depression). According to Cresswell and Eklund (2005b) burnout consists of continuous variables, each varying along a frequency continuum rather than a dichotomous variable where characteristics are either present or absent.

Cresswell and Eklund (2003) provided practitioners with the most comprehensive summary of the early signs (indicating players who are at greater risk of burning out), symptoms, potential consequences and intervention strategies (both preventative and management approaches) associated with the burnout syndrome among rugby union players. The diagrammatical guide compiled by these researchers' lists moodiness, mood swings and changes in mood as symptoms and potential consequences of burnout. Goodger et al. (2010) has alluded to the difficulty of distinguishing between the symptoms and consequences of certain syndromes. For example, mood state changes may at the same time be a symptom and consequence of burnout.

Mood states have received considerable research attention within the context of burnout and overtraining syndromes ever since Smith (1986) listed tension, fatigue and irritability as symptoms of burnout. Lane and Terry (2000: 16) define mood as "a set of feelings, varying in intensity and duration, usually involving more than one emotion", whilst Covassin and Pero (2004) showed mood to play a significant role in sporting performance.

Ample evidence suggests that burnout is positively associated with shifts in mood states and mood disturbance (Hackney, Pearman & Nowacki, 1990; Gould, Tuffey, Udry & Loehr, 1996; Cresswell & Eklund, 2003; Lemyre, Treasure & Roberts, 2006; Goodger, Gorely, Lavallee & Harwood, 2007; Weinberg & Gould, 2011). Among rugby union players, Cresswell and Eklund (2003) noted that such mood changes may result in antisocial behaviour (e.g., players becoming difficult to be around or distancing themselves from others). Despite ample evidence linking burnout with mood state changes (albeit as a symptom and/or consequence of the syndrome), the strength of this relationship has to the best of our knowledge not been studied adequately.

Cresswell and Eklund (2006) noted that few studies on athlete burnout have incorporated longitudinal approaches. Their research revealed the multidimensional and dynamic nature of this negative experiential state by showing that burnout tends to fluctuate with changes in situational and environmental demands during the course of a season. This necessitates longitudinal approaches to burnout research, since cross-sectional and retrospective studies contains little information about the onset and development of burnout, thereby limiting the conclusions which can be drawn.

If mood state changes are to be used as an effective symptomatic marker for burnout as proposed by Cresswell and Eklund (2003), it is postulated that changes in burnout scores over time would be accompanied by similar changes in mood state scores. In addition, it is expected that the strength of the relationship between burnout and mood state scores would remain consistent.

The aim of this study was to determine whether changes in burnout scores would be accompanied by similar changes in mood state scores, and to determine whether the strength of the relationship between burnout and mood state scores would remain constant over a five-month pre-season training, pre-competition and competition phase.

Methods

Design

Repeated measurements were taken over a five-month pre-season training, pre-competition and competition period, because Cresswell and Eklund (2006) showed that burnout tends to fluctuate with changes in the demands of the sport over time. Data were gathered at three-weekly intervals (seven time points in total) in order to establish a meaningful pattern over time.

Participants

Forty-one male student rugby union players (mean age: 22.26 ± 1.39 years at test point T_1) from the North-West University PUK Rugby Institute (NWU-PRI) (a leading rugby union club in South Africa) served as participants. The participant's ages ranged from 19.42 to 24.69 years at test point T_1. On average, they reported participating in organised rugby for 13.78 ± 2.39 years (range: 6.0 – 18.0 years) at the time of first data collection.

The decision to study student rugby players was based on availability (a purposeful sample was used). Perreault, Gaudreau, Lapointe and Lacroix (2007) found that student athletes face multiple sources of stress associated with their academic and sporting activities. The need to study burnout among elite student athletes due to their performance and training-related efforts coupled with full-time academic commitments was emphasised by Gould and Whitley (2009).

Inclusion and exclusion criteria

All the participants in this study formed part of the senior training squad of the NWU-PRI that participated in the inaugural First National Bank Varsity Cup (FNB VC) tournament during 2008. To qualify for participation in this tournament (that included the top eight tertiary institutions in South Africa), the players had to be younger than 25 years of age and enrolled as full-time students. The players also had to remain part of the senior training squad of the club throughout the five month study period and had to complete the various questionnaires during at least four of the seven test occasions. Players who did not meet all of the inclusion criteria as well as those who missed two weeks of training due to injury/ illness were excluded from the final sample population. This resulted in 15 of the total 56 players being omitted from the final sample group. Detailed inclusion/exclusion criteria are further discussed in the procedures section.

The sample was, therefore, a homogenous group because all of the participants were subjected to similar training and competition stressors (having been part of the same training programme and matches) as well as non-sport stressors (studies and general student life). However, since all athletes have different optimal training loads and recovery needs (Gould & Whitley, 2009; Goodger et al., 2010), varied stress perceptions and burnout experiences between individuals were expected. Despite attempts to study a group of players undergoing similar training, competition and non-sport stressors, it is likely that the actual and perceived stressors experienced were not constant across all participants.

Procedure

Ethical approval for this study was obtained from the Ethics Committee of the North-West University, Potchefstroom Campus (number: NWU-0064-08-A1). The head coach of the senior first rugby team of the NWU-PRI was informed about the nature and purpose of the study, after which he provided consent and enabled frequent access to the players. Multiple data collection dates were scheduled from the start of pre-season training (31 October 2007) until the completion of the round-robin stage of the FNB VC (26 March 2008) (see Table 1). It was agreed before the onset of the study that the players would not be subjected to any further data gathering after the round-robin stage of the tournament.

Table 1: The data collection schedule, seasonal information and number of participants

Test point:	T_1[#]	T_2	T_3*	T_4	T_5	T_6	T_7
Date:	31/10/07	21/11/07	05/12/07	16/01/08	07/02/08	27/02/08	18/03/08
Phase of season:	Pre-season training phase: [#] *This six-week phase commenced after a one month off-season.* * *T_3 was followed by a five-week holiday period.*			Pre-competition training phase: *Six weeks of pre-competition training and selection trials.*		Competition phase: *2008 First National Bank Varsity Cup (Seven round-robin matches).*	
Participants:	n = 31	n = 38	n = 38	n = 40	n = 37	n = 33	n = 31

Data collection was scheduled before the midweek video analysis and mental skills training sessions on afternoons when no on-field training took place. The participants were informed about the nature and purpose of the study and signed informed consent forms before they completed the research instruments for the first time. Throughout the study period, the completion of the research questionnaires took place at the same time of day, in the same classroom away from the practice field throughout the study period and in the presence of the leading author. Instructions to the participants included a statement aimed at discouraging socially desirable answers.

Confidentiality of results was guaranteed and it was made clear that participation at each test point was voluntary. Participants were free to withdraw their participation at any time without having to provide reasons and without prejudice. Some participants refrained from completing the measuring instruments at certain test points, thereby contributing to varying group sizes at the different test points (see Table 1). Reasons why participants refrained from completing the instruments at these time points remain unknown, as they were not required to provide reasons for non-participation. Examinations, tests, class schedules, injury or illness potentially contributed to the non-completion at the various test points.

In addition, a number of the players only joined the senior training squad by the second test point (T_2) as they first completed their academic study year at another tertiary institution (by mid November 2007) before joining the NWU-PRI. Another group of players were given a mandatory one month off-season break since following their participation in the U/19 and U/21 provincial tournaments which lasted until mid October 2007. Therefore, the participant numbers at test point T_1 is smaller than at test points T_2 to T_5. Similarly, the number of participants at test points T_6 and T_7 (competition phase) was less than at test points T_2 to T_5. Players who were not included in the tournament squad showed a lack of interest to continue their participation in the study. However, if they adhered to the set inclusion criteria, failure to remain part of the study until the final test point (T_7) did not result in exclusion from the final sample group. The final data set was 86.41% complete, which is deemed acceptable for longitudinal studies of this nature.

The five-month training, pre-competition and competition period was chosen for methodological and practical reasons. Within the rugby year, this prestigious tournament on the tertiary institution calendar takes place in isolation at the start of the new academic year (early February to mid April). Therefore, all the student players (aged 25 years or younger) of the club were eligible for selection. Throughout this period, a large number of players (56 players during the 2007/8 season) formed part of the senior training squad. However, immediately after the completion of the FNB VC, the age group players returned to the u/19 or u/21 training squads for the remainder of the 2008 season in preparation for the respective provincial tournaments. All of the players older than 21 years continued to represent the first senior team in the provincial and national club tournaments. With the players being part of three different training squads from mid April, it was foreseen that it would become exceedingly difficult to monitor these players effectively. Further data analysis would also be of little value as the players were no longer subject to the same coaching, training and playing conditions. It was, therefore, decided during the planning phase that the players would only be monitored over a period of five months, whilst they formed part of the same training squad.

Measuring instruments

The Athlete Burnout Questionnaire (ABQ)

The *ABQ* was developed by Raedeke and Smith (2001) as a psychometrically sound measure of athlete burnout. Preliminary development of this instrument based on initial item development, panel feedback and factor analysis (sample of 236 swimmers) yielded an internally consistent, content and factorially-valid measure consisting of the following three subscales: *Reduced Sense of Accomplishment, Sport Devaluation and Emotional/Physical Exhaustion*.

Thereafter, the revised measure's factor structure and correlations between the burnout subscales and theoretically related constructs yielded a psychometrically sound assessment of athlete burnout (sample of 244 senior age-group swimmers), whilst construct validity and reliability (internal consistency and test-retest) were supported (sample of 208 college athletes).

The *ABQ* consists of 15 items with five items contributing to each of the three subscales namely, *Reduced Sense of Accomplishment, Sport Devaluation and Emotional/Physical Exhaustion*. Participants responded to individual items on a five-point Likert-type scale anchored by descriptors ranging from "*Almost never*" [1] to "*Most of the time*" [5]. The *Total Burnout Score* was derived by averaging the three subscale scores. The *ABQ* was adapted for this study to be specific for the rugby population through minor word substitution (i.e., changing the word "sports" to "rugby") as was done by Cresswell and Eklund (2006) in their study on New Zealand rugby players. The Cronbach alpha coefficients for the three burnout subscales and the *Total Burnout Score* for the current dataset ranged from 0.73 to 0.81, making it a suitable instrument for the study. These reliability values were based upon the total number of senior training squad members (N = 56) who completed the *ABQ* at least once, even though only 41 of these players were included in the final sample group based on the inclusion and exclusion criteria.

The Stellenbosch Mood Scale (STEMS)

The *STEMS* of Terry, Potgieter and Fogarty (2003) is a derived and shortened version of the original Profile of Mood States (POMS) questionnaire (McNair, Lorr, & Droppleman, 1971). The POMS has been the most widely used measuring instrument (314 publications within sport and exercise psychology settings between 1971 and 2000 used the POMS) to assess transient, distinct mood states in sport (LeUnes, 2000). However, the POMS (consisting of 65 items) has been criticised for taking too long to complete, whilst questions were also raised over the use thereof among adolescent athletic populations, as it was originally developed for adult psychiatric out-patients (Terry, Lane, Lane & Keohane, 1999). The shortened (24-item) Profile of Mood States-Adolescents (POMS-A) questionnaire was subsequently developed and validated for use with adolescents (Terry et al., 1999).

The dual language (Afrikaans and English) *STEMS* consists of 24 items and measures the same six subscales as the original POMS questionnaire, i.e., *Tension, Depressive Mood, Anger, Vigour, Fatigue* and *Confusion*, with four items contributing to each subscale. A *Total Mood State Score* was derived by subtracting the five negative mood state scores from the *Vigour* score. Participants were asked to rate the 24 mood descriptors on a five-point Likert-type scale, anchored by descriptors ranging from "*Not at all/Glad nie*" [0] to

"*Extremely/Uiters*" [4]. Acceptable psychometric properties were shown after confirmatory factor analysis (based on 463 student athletes), whilst predictive and criterion validity still has to be determined. The *STEMS* was the instrument of choice for this particular study because of its bilingual nature, its short completion time and its promising psychometric properties for use among student athletes (Terry et al., 2003). Acceptable internal consistencies were calculated for the current dataset with Cronbach alpha values ranging from 0.65 to 0.87 (based on the data of 56 participants).

Analysis

The Statistical Data Processing package STATISTICA (Statsoft Inc., 2009) was used for the statistical analysis. Effect size calculations were used to indicate practical significant differences in subscale scores between various test points. Steyn (2009) gives the following guidelines for psychological investigations with Cohen's *d*-values of around 0.20, 0.50 and 0.80 interpreted as small, medium and large effect sizes, respectively.

Because random sampling was not used, statistical inference was not used to examine relationships between variables. Rather, the strength of the relationships according to the size of the correlation coefficient (r) was tested (Cohen, 1988; Field, 2009; Steyn, 2009). Because we were only interested in monotone relationships and not necessarily linear relationships, Spearman's rank order correlation coefficient was used to examine the strength of the relationships between the different burnout and mood state subscales. Steyn (2009) gives the following guidelines for psychological investigations with *r*'s of around 0.10, 0.30 and 0.50 interpreted as small, medium and large effect sizes, respectively.

Results

Table 2 reported the average and standard deviation scores for the *ABQ* and *STEMS* subscales over the seven test points, whilst practical significant changes (moderate and large effect sizes) between test points were indicated. Detailed information about the magnitude of the observed differences as well as the test points between which these differences occurred follows after the Table.

Table 2: Descriptive statistics of the *ABQ* and *STEMS* subscales for student rugby players over a five-month pre-season training, pre-competition and competition phase

	Mean ± Standard deviation scores						
	T_1	**T_2**	**T_3**	**T_4**	**T_5**	**T_6**	**T_7**
ABQ:							
Total Burnout Score	1.79±0.47	1.83±0.45	1.83±0.50	1.82±0.50	1.86±0.57	1.82±0.60	1.77 ± 0.55
Reduced Sense of Accomplishment	2.20±0.64	2.21 ±0.69	2.14 ±0.63	2.22 ±0.65	2.29 ±0.74	2.36 ±0.66	2.17 ± 0.62
Sport Devaluation	1.4±0.44	1.45 ±0.49	1.47 ±0.52	1.47 ±0.58	1.48 ±0.62	1.48 ±0.70	1.55 ± 0.61
Emotional/Physical Exhaustion °	1.72±0.59	1.84 ±0.56	1.88 ±0.70	1.79 ±0.55	1.81 ±0.61	1.62 ±0.66	1.59 ± 0.64
STEMS:							
Total Mood State Score °	- 3.68±10.86	- 4.66±10.68	- 4.68±3.10	- 3.36±12.51	- 6.51±16.17	- 2.36±14.29	2.61 ± 8.65
Tension	2.74 ±2.61	2.66 ± 3.18	2.55±3.24	2.97 ± 3.31	3.05 ± 3.56	2.52 ± 2.92	2.03 ± 2.77
Depressive Mood °	1.65 ±2.78	1.97 ± 2.35	2.13±3.17	1.72 ± 2.32	2.32 ± 3.43	1.82 ± 2.96	0.65 ± 1.25
Anger °	1.71 ±2.22	2.87 ± 3.31	1.87±2.23	1.77 ± 2.18	2.65 ± 3.16	1.94 ± 2.95	0.84 ± 1.55
Vigour	9.35 ±2.59	9.87 ± 2.80	9.16±3.37	9.38 ± 3.21	8.78 ± 3.74	8.79 ± 3.35	9.39 ± 3.18
Fatigue °°	4.68 ±2.75	5.05 ± 2.54	5.37±3.12	3.85 ± 2.76	4.38 ± 3.61	2.64 ± 2.37	2.03 ± 2.15
Confusion °	2.26 ±2.53	1.97 ± 2.47	1.92±2.82	2.44 ± 3.03	2.89 ± 3.31	2.24 ± 3.38	1.23 ± 2.00

° Subscale for which moderate ($d \approx 0.5$) practical significant differences were observed between test points; °°Subscale for which moderate ($d \approx 0.5$) and/or large ($d \approx 0.8$) practical significant differences were observed between test points, T_1-T_2 = test points.

Emotional/Physical Exhaustion was the only *ABQ* subscale that yielded significant changes between different test points. By test point T_7 (competition phase) the *Emotional/Physical Exhaustion* score was significantly ($d = 0.42$) lower than the score at test point T_3 (pre-season training phase), presumably reflecting the impact of tapering during the competition phase.

The *Total Mood State Score* was significantly higher at test point T_7 than at test points T_1 ($d = 0.58$), T_2 ($d = 0.68$), T_3 ($d = 0.56$), T_4 ($d = 0.48$) and T_5 ($d = 0.56$) respectively. As this score was determined by subtracting the five negative mood subscales from the *Vigour* subscale, a higher (or positive) score reflects better results. It was clear that the five negative mood subscales had the lowest values at test point T_7, whilst the *Vigour* subscale underwent no significant changes throughout the study period. The extent of the lower negative mood subscale

scores at T_7 resulted in the *Total Mood State Score* to have a positive value at this test point only, hence the significant differences compared to the scores at test points T_1 to T_5.
Depressive Mood was significantly lower at test point T_7 than at test points T_2 (d = 0.56), T_3 (d = 0.47), T_4 (d = 0.46), T_5 (d = 0.49) and T_6 (d = 0.40). The participants also exhibited significantly less *Anger* at test point T_7, compared to test points T_2 (d = 0.61), T_4 (d = 0.43) and T_5 (d = 0.57).

The *Fatigue* scores also differed significantly between numerous test points. Firstly, the scores at test point T_6 were significantly lower that of test points T_1 (d = 0.74), T_2 (d = 0.95), T_3 (d = 0.87), T_4 (d = 0.44) and T_5 (d = 0.48). Similarly the scores at test point T_7 were significantly lower than that of test points T_1 (d = 0.96), T_2 (d = 1.19), T_3 (d = 1.07), T_4 (d = 0.66) and T_5 (d = 0.65). The lowered values at both T_6 and T_7 (the competition phase) again indicated effective tapering as outlined in the earlier discussion regarding *Emotional/Physical Exhaustion.* In addition, the *Fatigue* levels at test point T_4 (directly after the holiday) was significantly lower than that observed during the pre-season training phase at the end of 2007 (test points T_2 (d = 0.44) and T_3 (d = 0.49)).

The highest *Confusion* scores were observed at test points T_4 and T_5, to the extent that both of these test points showed significantly higher values than T_7 (d = 0.40 and d = 0.50, respectively). The pre-competition training phase (T_4 and T_5) was marked by selection trials, team selection, new game plans, uncertainty about the new tournament as well as the introduction of the new Experiential Law Variations (ELV's). These rule changes were considerable and might have left some of the players confused at the start of 2008, after which they presumably adapted to these changes later during the tournament.

Tables 3 to 6 revealed the strength of the relationships between the *Total Burnout Score* (and the three *ABQ* subscales) and the *Total Mood State Score* (and the six *STEMS* subscales) at the different test points ($T_1 – T_7$). Collectively, these four tables illustrate that *Burnout* (a negative experiential state) and the three *ABQ* subscales are inversely correlated with *Vigour* (a positive mood state) and the derived *Total Mood State* score. A positive relationship also existed between *Burnout* (and the three *ABQ* subscales) and the remaining five negative Mood State subscales (i.e., *Tension, Depressive Mood, Anger, Fatigue* and *Confusion*).

Table 3 indicated practical significant correlations (relationships) of moderate to large magnitude between *Total Burnout* and the various *Mood State* subscales. Notably, *Fatigue, Confusion* and the *Total Mood State Score* showed a strong relationship with *Total Burnout* from test points T_1 to T_5 (pre-season training and pre-competition phase) Strong correlations between most of the *Mood State* subscales and *Total Burnout* were also evident at test points T_1, T_4 and T_5.

Practical significant correlations (relationships) were evident between *Reduced Sense of Accomplishment* and *Tension*, *Depressive Mood*, *Anger*, *Confusion* and the *Total Mood State Score*, respectively (see Table 4). The strength of these relationships was the strongest at test points T_1, T_4 and T_5.

Table 3: The correlation (*r*) between the *Total Burnout Score* and the various *STEMS* subscales for student rugby players over a five-month pre-season training, pre-competition and competition phase

	ABQ: Total Burnout Score						
STEMS subscales:	T1	T2	T3	T4	T5	T6	T7
Tension	0.53°°	0.14	0.37°	0.53°°	0.50°°	0.48°°	0.36°
Depressive Mood	0.59°°	0.23	0.33°	0.42°°	0.73°°	0.33°	0.35°
Anger	0.52°°	0.25°	0.14	0.48°°	0.65°°	0.19	0.25°
Vigour	-0.49°°	-0.26°	-0.20	-0.39°	-0.46°°	-0.32°	-0.09
Fatigue	0.33°	0.48°°	0.40°°	0.57°°	0.44°°	0.31°	0.04
Confusion	0.57°°	0.35°	0.32°	0.43°°	0.65°°	0.25°	0.17
Total Mood State	-0.72°°	-0.43°°	-0.41°°	-0.63°°	-0.73°°	-0.39°	-0.29°

°Moderate practical significant correlation (relationship) ($r \approx 0.3$); °°Large practical significant correlation (relationship) ($r \approx 0.5$)

Table 4: The correlation (*r*) between *Reduced Sense of Accomplishment* and the *STEMS* subscales for student rugby players over a five-month pre-season training, pre-competition and competition phase

	ABQ: Reduced Sense of Accomplishment						
STEMS subscales:	T1	T2	T3	T4	T5	T6	T7
Tension	0.50°°	0.07	0.38°	0.47°°	0.32°	0.51°°	0.16
Depressive Mood	0.47°°	0.06	0.19	0.33°	0.53°°	0.26°	0.19
Anger	0.47°°	0.16	0.03	0.46°°	0.45°°	0.19	0.07
Vigour	-0.39°	-0.31°	-0.12	-0.31°	-0.37°	-0.26°	-0.15
Fatigue	0.14	0.45°°	0.28°	0.33°	0.22	0.27°	-0.02
Confusion	0.65°°	0.28°	0.27°	0.44°°	0.50°°	0.20	-0.06
Total Mood State	-0.62°°	-0.34°	-0.30°	-0.52°°	-0.51°°	-0.35°	-0.13

°Moderate practical significant correlation ($r \approx 0.3$); °°Large practical significant correlation ($r \approx 0.5$)

Table 5: The correlation (*r*) between *Sport Devaluation* and the *STEMS* subscales for student rugby players over a five-month pre-season training, pre-competition and competition phase

	ABQ: Sport Devaluation						
STEMS subscales:	T1	T2	T3	T4	T5	T6	T7
Tension	0.34°	0.06	0.23	0.38°	0.54°°	0.38°	0.31°
Depressive Mood	0.42°°	0.16	0.30°	0.32°	0.78°°	0.28°	0.30°
Anger	0.36°	0.13	0.17	0.28°	0.71°°	0.12	0.26°
Vigour	-0.41°°	-0.16	-0.02	-0.40°°	-0.43°°	-0.16	-0.12
Fatigue	0.20	0.11	0.12	0.46°°	0.46°°	0.15	0.01
Confusion	0.37°	0.22	0.21	0.27°	0.70°°	0.24	0.17
Total Mood State	-0.50°°	-0.21	-0.24	-0.48°°	-0.77°°	-0.28°	-0.28°

°Moderate practical significant correlation ($r \approx 0.3$); °°Large practical significant correlation ($r \approx 0.5$)

Table 5 indicates the practical significant correlations (relationships) of a large magnitude between the *Sport Devaluation* subscale and all of the *STEMS*

subscales at T_5 (the period during which selection trials took place). It could be argued that the perceived value of the sport may be enhanced when a player is selected for a team, whereas the sport may loose some of its value when a player is not selected. Both selection and omission from the team may evoke strong emotions and mood changes, potentially contributing to the strong correlation between *Sport Devaluation* and *Mood States*.

Table 6: The correlation (*r*) between *Emotional/Physical Exhaustion* and the *STEMS* subscales for student rugby players over a five-month pre-season training, pre-competition and competition phase

	ABQ: Emotional/Physical Exhaustion						
STEMS subscales:	T1	T2	T3	T4	T5	T6	T7
Tension	0.47°°	0.20	0.27°	0.50°°	0.46°°	0.41°°	0.47°°
Depressive Mood	0.57°°	0.35°	0.31°	0.41°°	0.61°°	0.35°	0.45°°
Anger	0.47°°	0.29°	0.14	0.48°°	0.57°°	0.21	0.33°
Vigour	-0.43°°	-0.11	-0.29°	-0.27°	-0.39°	-0.43°°	0.02
Fatigue	0.48°°	0.49°°	0.53°°	0.66°°	0.50°°	0.42°°	0.12
Confusion	0.39°	0.29°	0.29°	0.36°	0.52°°	0.24	0.33°
Total Mood State	-0.67°°	-0.44°°	-0.44°°	-0.59°°	-0.65°°	-0.43°°	-0.37°

°Moderate practical significant correlation ($r \approx 0.3$); °°Large practical significant correlation ($r \approx 0.5$)

Throughout the testing period, the *Emotional/Physical Exhaustion* subscale (feelings of being overextended and exhausted because of sport involvement) showed the strongest relationship (of the three Burnout subscales) with the various *Mood State* subscales and *Total Mood State Score* (Table 6).

Discussion

The observed fluctuations in the *Emotional/Physical exhaustion* score between test points T_3 and T_7 was presumably brought about by a decrease in the training demands from pre-season training to the competition phase. To this extent, Cresswell and Eklund (2006) provided evidence that burnout fluctuates relative to the changes in situational and environmental demands (e.g., player perceptions regarding team environment). Whilst the study focused on burnout, the majority of the participants fell in the normal to low burnout categories. Cox, Tisserand and Taris (2005) noted this to be a common problem of the existing burnout research. As no other significant *Burnout* subscale changes occurred over the duration of the study, the observed fluctuations in the *mood state* scores may have reflected a stress response among the participants, as opposed to a burnout response.

The strength of the correlation between the respective *STEMS* subscales and *Reduced Sense of Accomplishment* potentially alludes to growing frustrations and unfulfilled expectations as the season progressed. Cresswell and Eklund (2004) linked *Reduced Sense of Accomplishment* among rugby players to perceived financial stress, which Lange and Byrd (1998) associate with feelings of tension

and depression among students in general. According to Cresswell and Eklund (2005b), team environment aspects (e.g., training, management strategies and team cultures) are strongly related to the *Reduced Sense of Accomplishment* scores. During test points T_4 and T_5 group factors (e.g., team cohesion, values and culture) were addressed during mental skills training sessions, thereby possibly contributing to the strong correlations (relationships) at these time points. Henschen (2000) note that low perceived accomplishment and the resulting worries of unfulfilled or excessive expectations could lead to mental fatigue. The current data partially substantiate this statement, as correlations of moderate to large magnitude were noted between *Reduced Sense of Accomplishment* and *Fatigue.*

The large practical significant correlations (relationships) found between the *Sport Devaluation* subscale and all of the *STEMS* subscales at test point T_5 (the period during which selection trials took place) are in line with that found by Cresswell and Eklund (2004) in situations where players were subjected to non-selection and/or injury. The players' perceptions regarding their possible inclusion or exclusion in the team may, therefore, have attributed to the strong relationship observed at this particular test point. In addition, moderate to large correlations were found between various mood subscales and *Sport Devaluation* at test points T_1 and T_4.

The *Emotional/Physical Exhaustion* subscale showed the strongest relationship with the various *Mood State* subscales and *Total Mood State Score.* In line with these findings, Cresswell and Eklund (2003; 2004) highlight negative mood shifts as a symptom of emotional exhaustion. Not surprisingly, the correlation between *Emotional/Physical Exhaustion* and *Fatigue* remained strong throughout (apart from test point T_7).

Conclusion

The observed changes in the *Total Mood State, Depressive Mood, Anger, Fatigue* and *Confusion* subscale scores without accompanying changes in the *Burnout* subscale scores raise questions about the effectiveness of mood state changes as a marker for burnout. These mood state changes seem to have been caused by factors other than that responsible for the onset and development of burnout.

Collectively, the results confirmed a strong relationship between burnout and mood states that was especially strong between the *Emotional/Physical Exhaustion* subscale and the various *STEMS* subscales and the *Total Mood State* score. Whilst the results highlight an association between the key characteristics of burnout and mood states, it does not imply prediction or causation. The observation that these relationships were stronger at certain time points stresses

the importance of temporal aspects as a key characteristic of burnout. However, the observed inconsistencies regarding the strength of the relationships between these variables at different test points, raises further questions over the use of mood state changes as an effective marker for burnout. Practitioners are cautioned against the use of mood state changes as a marker for burnout in isolation.

Limitations and Recommendations

The study sample was relatively small, thereby limiting the conclusions which could be made. In addition, the number of participants tested during each of the seven test points varied between 31 and 40, resulting in different numbers of players being compared throughout the study period. As the participants were not a randomly selected group, these results should be generalised to other rugby playing populations with caution. The duration of the present study (a pre-season training, pre-competition and competition period lasting 21 weeks) may have been inadequate to capture the full extent of the fluctuations in the burnout and mood state scores, as well as the relationship between these subscales. It is suggested that future research on burnout should be conducted over an even longer timeframe.

Future studies should also investigate the influence of possible mediating factors to the observed changes in burnout and mood state scores, whilst at the same time determining the effect thereof on the strength of the relationship between these variables. Such information could be invaluable for the timely and appropriate intervention (prevention and/or management) for players who show signs and symptoms of burnout and in doing so facilitate the general well-being of these players and contribute to performance.

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