

FACTORS AFFECTING THE RECOVERY-STRESS, BURNOUT AND MOOD STATE SCORES OF ELITE STUDENT RUGBY PLAYERS

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ABSTRACT

A sample of 41 male student rugby players (mean age: 21.87 ± 1.39 years) completed the Recovery-Stress Questionnaire (Kellmann & Kallus, 2001), Athlete Burnout Questionnaire (Raedeke & Smith, 2001) and Stellenbosch Mood Scale (Terry et al., 2003) repeatedly over a five-month period. Independent t-tests, one-way analysis of variance and effect sizes were used to indicate significant differences between groups (categorised according to playing position, experience level and starting status). The group of forwards were shown to have significantly ($d \approx 0.5$) better results than the backline players for 12 of the 39 tested variables. The group of less experienced players had significantly less General and Sport-specific Stress and negative Mood State scores than their very experienced and novice counterparts, whilst the novice players showed greater General and Sport-specific Recovery scores. Differences in starting status were also observed as the reserve players were shown to have significantly higher General and Sport-specific Recovery scores and better Mood State scores than the regular starters. These results suggest that playing position, experience level and starting status should be considered in player management strategies and during the psycho-social monitoring of players aimed at reducing the onset and development of overtraining and burnout.

Key words: Overtraining; Recovery-stress; Burnout; Mood States; Rugby.

INTRODUCTION AND PROBLEM STATEMENT

Numerous physiological, psychological and social stressors are believed to contribute to the onset and development of the overtraining and burnout syndromes (Kenttä & Hassmén, 1998; Kenttä *et al.*, 2001). In Kenttä and Hassmén's (1998) conceptual model of overtraining and recovery, overtraining and burnout are seen as the negative products of long-term imbalances between the total stressors and total recovery efforts, which exceed an athlete's maximum stress tolerance. Despite the significant contributions of psychological and social stressors,

increased training loads are still regarded as the greatest contributor to these syndromes. In this regard rugby players have reported heightened exhaustion levels due to increased average weekly training volumes, more games per season and shorter off-seasons (Creswell & Eklund, 2005). The best treatment for athletes suffering from these conditions seems to be complete rest, but this approach directly opposes the instinctive reaction of coaches and players to increase their training efforts in response to poor performances (Marshall, 2005).

Overtraining can be defined as “a syndrome that results when excessive, usually physical overload on an athlete occurs without adequate rest” (Gould & Dieffenbach, 2002: 25). Raedeke *et al.* (2002) conceptualised athlete burnout as an enduring psycho-social syndrome characterised by a reduced sense of accomplishment (a perceived lack of achievement and success), sport devaluation (a decrease of the perceived benefits gained from sport involvement) and emotional and physical exhaustion (feelings of being overextended and exhausted due to sport involvement). These syndromes are distinctly different, although they share certain signs, symptoms and contributing causes.

Between 5.6% and 24.3% of rugby players experience burnout symptoms on a frequent basis (Creswell & Eklund, 2006a), whilst a substantial number (30%) of team sport athletes have been shown to suffer from overtraining syndrome (Kenttä *et al.*, 2001). The negative impact of these syndromes on the performance and well-being of rugby players is of great concern for coaches, sport psychology consultants, sport scientists, sport medicine personnel and the players themselves (Creswell & Eklund, 2003).

Grobbeelaar *et al.* (2010) monitored the burnout and recovery-stress levels of rugby players throughout a five-month pre-season, pre-competition and competitive season and reported significant fluctuations during this period. However, this study did not investigate possible contributing factors to the observed changes over time. A number of sport-related factors which affect the recovery-stress, burnout and mood state scores of athletes have been identified (e.g., starting status, playing position and experience level). Raglin and Wilson (2000) found that players not selected in the starting team were more likely to exhibit increases in mood disturbance during intense training than those in the starting line-up. Mashiko *et al.* (2004) noted that the influence of playing position should be accounted for in the development of recovery strategies directly after the conclusion of rugby matches. It was also revealed that more experienced soccer players had significantly greater positive general mood profiles than less experienced players (Thelwell *et al.*, 2006). From their extensive research on burnout among rugby players, Creswell and Eklund (2005; 2006a; 2006c) deemed factors such as playing position, experience levels and starting status worthy of further investigation as possible contributing factors to the onset and development of burnout.

Subsequently, the aim of this study was to compare elite student rugby players' recovery-stress, burnout and mood state scores, based on their playing position, experience level and starting status. Information on the role of these factors on overtraining and burnout scores might assist coaches, sport psychology consultants and sport scientists in the prevention or management of the possible onset and development of these negative experiential syndromes.

RESEARCH METHODS

Research design

A longitudinal research design was implemented. Data were gathered on seven test points (at three-weekly intervals) over a five-month training and competitive period.

Subjects

Forty-one male rugby union players (with a mean age of 21.87 ± 1.39 years at the first data collection point) from a leading club in South Africa, i.e. the North-West University PUK Rugby Institute (NWU-PRI) were included as subjects in this study. They had on average been playing rugby for 13.76 ± 2.39 years. These players formed part of the NWU-PRI senior training squad and represented the 1st or 2nd senior teams until after the completion of the 2008 FNB Varsity Cup rugby tournament. In order to qualify for participation in this tournament (which included the top eight tertiary institution teams in South Africa) the subjects had to be 25 years of age or younger and enrolled as students. The subject group is, therefore, a particularly homogenous group, since they were all subject to similar training and competitive stressors (having been part of the same training programme and matches), as well as non-training stressors (studies and general student life).

The decision to study student rugby players was based on availability and their proposed vulnerability to overtrain and burn out due to their sport participation and the added stress of their academic endeavours. Only players who completed at least four of the seven test occasions over the five-month period and who remained in the senior training squad throughout were included in the subject group. Missing data from the final dataset were 13.59%, which is deemed acceptable for repeated measurements over this timeframe.

Research instruments

The Recovery-Stress Questionnaire for athletes (RESTQ-52 Sport)

The RESTQ-52 Sport, developed by Kellmann and Kallus (2001) measures the frequency of stressors and recovery activities and provides the coaching staff with important information during the training process. The recovery-stress state indicates the extent to which athletes are physically and/or mentally stressed, whether or not they are capable of using individual strategies for recovery, as well as which strategies they use. The RESTQ Sport consists of two versions (i.e., a 52 and 72 item questionnaire). Kellmann and Kallus (2001) recommend the use of the 52 item version in longitudinal research designs such as the present one. Participants were asked to respond to the items on a seven-point Likert-type scale anchored by descriptors ranging from "Never" [0] to "Always" [6] indicating how often the respondent participated in various activities during the past three days/nights. Nineteen subscale scores were derived, which were further grouped into the following four major subscale groups:

- **General Stress Subscale** (*General Stress, Emotional Stress, Social Stress, Conflicts/Pressure, Fatigue, Lack of Energy and Physical Complaints*).
- **General Recovery Activity Subscale** (*Success, Social Recovery, Physical Recovery, General Well-being and Sleep Quality*).

- **Sport-specific Stress Subscale** (*Disturbed Breaks, Burnout/Emotional Exhaustion and Fitness/ Injury*).
- **Sport-specific Recovery Activity Subscale** (*Fitness/Being in Shape, Personal Accomplishments, Self-efficacy and Self-regulation*).

In the RESTQ-52 Sport, two items respectively contribute to each of the *General Stress* and *General Recovery Activity* subscales, with four items contributing to each of the *Sport-specific Stress* and *Sport-specific Recovery Activity* subscales. Construct validity has been reported for this instrument (Kellmann & Kallus, 2001). Due to the small sample size validity will not be determined. In the present survey, acceptable Cronbach alphas (ranging from 0.58 - 0.88) were calculated for 15 of the 19 subscales. Four of the subscales yielded poor reliability scores (*Lack of Energy* = 0.34; *Physical Complaints* = -0.02; *Social Recovery* = 0.39; *Physical Recovery* = 0.42). As a result, these four subscales were removed from the data set and substituted by the two items from which they were each derived. Thereafter, the four major subscale groups were found to be reliable (*General Stress major subscale group* = 0.81; *General Recovery Activity major subscale group* = 0.68; *Sport-specific Stress major subscale group* = 0.67; *Sport-specific Recovery Activity major subscale group* = 0.86).

The Athlete Burnout Questionnaire (ABQ)

The 15-item ABQ was developed by Raedeke and Smith (2001) as a valid and reliable measure of the following three burnout subscales (with five items contributing to each):

- *Reduced Sense of Accomplishment* (e.g., “It seems no matter what I do, I don’t perform as well as I should”).
- *Sport Devaluation* (e.g., “I have negative feelings toward sport”).
- *Emotional/Physical Exhaustion* (e.g., “I am exhausted by the mental and physical demands of my sport”).

For this study, the ABQ was adapted to be specific for the rugby population through minor word substitution (i.e., changing the word “sports” to “rugby”) as was done by Creswell and Eklund (2006a; 2006b) in their studies on New Zealand rugby players. 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. Internal consistency estimates observed in the present investigation (Cronbach alphas between 0.73 to 0.81 for the three subscales and the *Total Burnout Score*) were largely consistent with previous reports.

The Stellenbosch Mood Scale (STEMS)

The STEMS (Terry *et al.*, 2003) is a dual-language (English and Afrikaans) version of the Brunel Mood Scale (BRUMS) questionnaire of Terry *et al.* (1999) which is a derivative of the Profile of Mood States (POMS) questionnaire of McNair *et al.* (1971). The STEMS consists of 24 items and measures six subscales, i.e. *Tension, Depression, Anger, Vigour, Fatigue* and *Confusion*, with four items contributing to each subscale. A *Total Mood Disturbance Score* was derived by subtracting the negative mood state scores from the *Vigour* score. Participants were asked to rate “How are you feeling right now” in terms of 24 mood descriptors on a five-point Likert-type scale, anchored by descriptors ranging from “Not at

all” [0] to “Extremely” [4]. Acceptable Cronbach alpha coefficients (ranging from 0.65 to 0.87) were found with this dataset.

Descriptive variables

The following descriptive variables were recorded throughout the study period.

- Playing position (Forward or backline player).
- Experience level: Players were grouped into the following three groups:
 - Very experienced group, i.e. players representing the 1st team for ≥ 3 years.
 - Less experienced group, i.e., players with one or two years experience at this level.
 - Novice group, i.e., players in their first season at this level.
- Starting status (For inclusion within a specific group, a player had to be included in that group for at least four of the seven games). Based on data obtained during the round-robin matches, players were grouped into the following two categories:
 - Regular starters (Included in the starting line-up for at least four of the matches).
 - Non-starters/ reserves (Included in the match 22 on at least four of the occasions).

Procedures

This study was approved by the Ethics Committee of the North-West University, Potchefstroom Campus (Reference number: NWU-0064-08-S1). The head coach of the NWU-PRI senior 1st team was informed about the nature and purpose of the study and was asked for consent, cooperation and input, which was provided. Multiple testing dates were scheduled from the start of pre-season training (31st October 2007) until the completion of the round-robin stage of the FNB Varsity Cup tournament (26th March 2008).

Where possible, testing was scheduled before the mid-week mental skills training and video analysis sessions. The participants were informed about the nature and purpose of the study and all of the participants completed informed (written) consent forms before their first completion of the research instruments. Confidentiality of results was guaranteed and participation at each test point was voluntary. Instructions to the subjects included a statement aimed at discouraging socially desirable answers.

Since this study did not aim to investigate changes in the various subscale scores over time, but rather to compare the scores of different sub-groups of players, the average scores obtained by each subject over the seven test points were calculated and used in the statistical analysis (for the comparison involving playing position and experience level). For the comparison between the regular starters and the reserve players, only the average scores of the data gathered during the competition period (Test 6 & Test 7) were used, as the possible influence of selection/non-selection and the resulting game-time is believed to be particularly relevant during this period. Also, only those players ($n = 23$) who were in the starting line-up or match-22 of the NWU-PRI's first team for at least four of the seven round-robin matches during the Varsity Cup tournament were included in this analysis.

Statistical analysis

The Statistical Data Processing package STATISTICA (Statsoft Inc, 2007) was used for the statistical analysis and the level of statistical significance was set at $p < 0.05$. For the comparisons involving the forwards and backline players, as well as between the regular starters and reserves (two groups respectively), independent *t*-tests were performed, whilst a One Way Analysis of Variance (ANOVA) were used to determine statistically significant differences between the three groups with varying experience levels. The ANOVA's were followed by Tukey's post Hoc tests for unequal sample sizes. In addition, because the subjects were not randomly selected, effect sizes (ES) were used to indicate practical significant differences for the subscales at the various time points, in which: $ES = (M_1 - M_2)/s_{(\max)}$. Here, M_1 = the mean value of the first group in the comparison, M_2 = the mean value of the second group in the comparison and $s_{(\max)}$ = the largest standard deviation of the two groups in the comparison. The calculated ES are expressed as Cohen's *d*-value and can be interpreted as follows: $d \approx 0.20, 0.50$ and 0.80 respectively indicate small, moderate and large practical significant differences (Steyn, 2009).

RESULTS AND DISCUSSION

Table 1 indicates the results of the comparison between the forwards and backline players for the various subscales. No significant age differences or numbers of years playing rugby were observed between players in the two positional groups. From these results it is evident that the forwards outperformed the backline players in all but one of the 39 variables in the analysis, whilst 21 of these variables were of moderate ($d \approx 0.5$) practical significant magnitude. Although this comparison conclusively showed the forwards to have more favourable scores than the backline players, the results differ from Creswell and Eklund's (2006a) study on burnout among professional New Zealand rugby players. The forwards (1.85 ± 0.08) in their study were reported to have significantly ($p = 0.008$) higher *Sport Devaluation* scores than the backline players (1.58 ± 0.09). Also, the forwards (2.43 ± 0.29) in the present study had significantly ($p = 0.062$) higher *Emotional/Physical Exhaustion* scores than the backline players (2.27 ± 0.30), which can in part be attributed to the greater workloads performed by forwards during rugby matches (Deutsch *et al.*, 1998). These conflicting results emphasise the need for further research in this regard, as this discrepancy either relates to the level of participation or other within-group influence(s) not accounted for in either/both of these studies.

TABLE 1. COMPARISON BETWEEN FORWARDS AND BACKLINE PLAYERS FOR THE RESTQ-52 SPORT, ABQ AND STEMS SUBSCALES

	Forwards (n=23)	Backline players (n=18)	Statistical significance (p value)	Practical significance (Cohen's d)
Average age	22.31 ± 1.36	22.18 ± 1.47	0.77	0.09
Average years playing rugby	13.59 ± 2.24	14.00 ± 2.61	0.60	0.16
TOTAL RECOVERY-STRESS (RESTQ-SPORT)	4.56 ± 2.05	3.35 ± 1.80	0.05 [■]	0.59 [°]
GENERAL STRESS MAJOR SCALE [#]	1.38 ± 0.62	1.57 ± 0.68	0.34	0.29
General Stress [#]	1.05 ± 0.69	1.31 ± 0.72	0.24	0.37 [°]
Emotional Stress [#]	1.26 ± 0.68	1.49 ± 0.62	0.26	0.34
Social Stress [#]	1.30 ± 0.81	1.55 ± 0.76	0.33	0.30
Conflicts/Pressure [#]	2.00 ± 0.97	2.23 ± 1.08	0.48	0.21
Fatigue [#]	1.47 ± 0.66	1.48 ± 0.80	0.97	0.01
Item 6 - I had difficulties in concentrating [#]	1.54 ± 0.60	1.88 ± 0.95	0.17	0.36 [°]
Item 23 - I put off making decisions [#]	1.25 ± 0.67	1.60 ± 0.87	0.15	0.40 [°]
Item 9 - I had a headache [#]	1.05 ± 0.70	0.97 ± 0.89	0.75	0.09
Item 12 - I felt uncomfortable [#]	1.32 ± 0.87	1.46 ± 0.85	0.62	0.16
GENERAL RECOVERY MAJOR SCALE	3.65 ± 0.71	3.31 ± 0.53	0.08	0.48 [°]
Success	3.28 ± 0.89	2.84 ± 0.52	0.07	0.50 [°]
Item 2 - I laughed	3.81 ± 0.81	3.80 ± 0.67	0.95	0.02
Item 8 - I had a good time with my friends	3.80 ± 1.13	3.55 ± 0.89	0.45	0.22
Item 4 - I felt physically relaxed	3.00 ± 0.68	2.75 ± 0.79	0.28	0.31
Item 21 - I felt as if I could get everything done	3.29 ± 0.94	2.80 ± 0.67	0.07	0.51 [°]
General Well-being	3.83 ± 0.82	3.50 ± 0.67	0.13	0.39 [°]
Sleep Quality	4.21 ± 0.96	3.76 ± 0.81	0.12	0.47 [°]
SPORT-SPECIFIC STRESS MAJOR SCALE [#]	1.26 ± 0.51	1.67 ± 0.73	0.04 [*]	0.56 [°]
Disturbed Breaks [#]	1.01 ± 0.59	1.35 ± 0.62	0.08	0.55 [°]
Burnout/Emotional Exhaustion [#]	0.81 ± 0.54	1.08 ± 0.75	0.19	0.36 [°]
Injury [#]	1.96 ± 0.68	2.58 ± 1.05	0.03 [*]	0.59 [°]
SPORT-SPECIFIC RECOVERY MAJOR SCALE	3.55 ± 0.86	3.29 ± 0.55	0.27	0.30
Being in shape	3.58 ± 0.84	3.27 ± 0.67	0.22	0.36 [°]
Personal accomplishment	3.21 ± 1.01	2.89 ± 0.65	0.24	0.32
Self-efficacy	3.73 ± 0.94	3.43 ± 0.64	0.25	0.32
Self-regulation	3.68 ± 1.00	3.57 ± 0.71	0.70	0.11
TOTAL BURNOUT SCORE (ABQ) [#]	1.71 ± 0.39	1.96 ± 0.48	0.07	0.53 [°]
Reduced Sense of Accomplishment [#]	2.14 ± 0.53	2.38 ± 0.52	0.15	0.45 [°]
Sport Devaluation [#]	1.39 ± 0.47	1.58 ± 0.54	0.25	0.34
Emotional/Physical Exhaustion [#]	1.61 ± 0.38	1.94 ± 0.52	0.02 [*]	0.64 [°]
TOTAL MOOD DISTURBANCE SCORE (STEMS)	-1.23 ± 8.06	-5.66 ± 12.0	0.17	0.37 [°]
Tension [#]	2.10 ± 1.76	3.36 ± 3.39	0.13	0.37 [°]
Depressive mood [#]	1.41 ± 1.78	2.23 ± 2.34	0.21	0.35 [°]
Anger [#]	1.79 ± 1.88	2.13 ± 1.90	0.57	0.18
Vigour	9.58 ± 2.18	8.98 ± 2.13	0.39	0.27
Fatigue [#]	3.86 ± 1.35	4.19 ± 1.92	0.52	0.17
Confusion [#]	1.65 ± 1.63	2.74 ± 2.93	0.14	0.37 [°]

[#] Lower values represent better results

Values in **bold** depict the group with the more favourable results for the particular subscale

* Statistically significant differences (p<0.05)

■ Borderline statistical significant difference (p=0.052)

° Moderate practical significant differences (d ≈ 0.5)

TABLE 2. COMPARISON OF THE RESTQ-52 SPORT SUBSCALES BETWEEN THE GROUPS OF VERY EXPERIENCED, LESS EXPERIENCED AND NOVICE PLAYERS

	Group 1 Very experienced players (≥ 3 years) (n = 12)	Group 2 Less experienced players (1 or 2 years) (n = 15)	Group 3 Novice players (0 years at this level) (n = 14)	Analysis of variance (ANOVA) Statistical significance (p value)	Effect size results (Cohen's <i>d</i> -value)		
					Practical significance between Groups 1 & 2	Practical significance between Groups 1 & 3	Practical significance between Groups 2 & 3
Average age	23.15 ± 0.99	22.67 ± 1.33	21.05 ± 0.85	≤0.01*	0.36°	2.11°	1.21°
Years playing rugby	15.25 ± 1.66	13.57 ± 2.06	12.71 ± 2.70	0.02*	0.81°	0.94°	0.32
TOTAL RECOVERY-STRESS (RESTQ-52)	<u>3.30 ± 2.00</u>	4.49 ± 2.25	4.17 ± 1.70	0.30	0.53°	0.44°	0.14
GENERAL STRESS MAJOR SCALE #	<u>1.77 ± 0.66</u>	1.11 ± 0.48	1.58 ± 0.64	0.02*	1.00°	0.30	0.72°
General Stress Minor #	<u>1.50 ± 0.68</u>	0.83 ± 0.62	1.23 ± 0.70	0.04*	0.98°	0.37°	0.58°
Emotional Stress #	<u>1.75 ± 0.68</u>	1.08 ± 0.46	1.36 ± 0.68	0.02*	0.99°	0.62°	0.37°
Social Stress #	<u>1.81 ± 0.88</u>	0.99 ± 0.59	1.51 ± 0.72	0.02*	0.93°	0.34	0.73°
Conflicts/ Pressure #	<u>2.36 ± 1.13</u>	1.67 ± 0.78	2.35 ± 1.04	0.11	0.61°	0.01	0.65°
Fatigue #	1.72 ± 0.76	1.20 ± 0.68	1.56 ± 0.66	0.15	0.68°	0.21	0.52°
Item 6 - I had difficulties in concentrating #	1.82 ± 0.55	1.38 ± 0.82	<u>1.92 ± 0.86</u>	0.15	0.54°	0.11	0.62°
Item 23 - I put off making decisions #	<u>1.70 ± 1.00</u>	1.12 ± 0.67	1.45 ± 0.59	0.15	0.58°	0.25	0.49°
Item 9 - I had a headache #	1.06 ± 0.64	0.61 ± 0.56	<u>1.39 ± 0.93</u>	0.02*	0.70°	0.35°	0.84°
Item 12 - I felt uncomfortable #	<u>1.96 ± 0.74</u>	0.93 ± 0.65	1.36 ± 0.87	≤0.01*	1.39°	0.69°	0.50°
GENERAL RECOVERY MAJOR SCALE	<u>3.37 ± 0.62</u>	3.41 ± 0.82	3.72 ± 0.44	0.25	0.05	0.56°	0.38°
Success	<u>2.88 ± 0.75</u>	3.01 ± 0.89	3.35 ± 0.63	0.27	0.15	0.63°	0.39°
Item 2 - I laughed	3.86 ± 0.79	<u>3.66 ± 0.93</u>	3.92 ± 0.45	0.65	0.21	0.07	0.27
Item 8 - I had a good time with my friends	3.73 ± 1.16	<u>3.21 ± 1.02</u>	4.17 ± 0.71	0.04*	0.45°	0.38°	0.94°
Item 4 - I felt physically relaxed	<u>2.67 ± 0.51</u>	3.07 ± 1.01	2.90 ± 0.49	0.36	0.40°	0.46°	0.17
Item 21 - I felt as if I could get everything done	<u>2.77 ± 0.58</u>	3.17 ± 0.98	3.23 ± 0.90	0.34	0.41°	0.52°	0.06
General Well-being	<u>3.61 ± 0.74</u>	3.68 ± 0.94	3.76 ± 0.61	0.57	0.07	0.21	0.09
Sleep Quality	3.85 ± 0.85	<u>3.79 ± 0.95</u>	4.38 ± 0.87	0.17	0.07	0.60°	0.62°

	Group 1 Very experienced players (≥ 3 years) (n = 12)	Group 2 Less experienced players (1 or 2 years) (n = 15)	Group 3 Novice players (0 years at this level) (n = 14)	Analysis of variance (ANOVA) Statistical significance (p value)	Effect size results (Cohen's <i>d</i> -value)		
					Practical significance between Groups 1 & 2	Practical significance between Groups 1 & 3	Practical significance between Groups 2 & 3
SPORT-SPECIFIC STRESS MAJOR SCALE [#]	<u>1.66 ± 0.69</u>	1.18 ± 0.51	1.53 ± 0.68	0.13	0.70 ^{oo}	0.20	0.51 ^o
Disturbed Breaks [#]	<u>1.38 ± 0.52</u>	0.85 ± 0.59	1.31 ± 0.64	0.05*	0.90 ^{oo}	0.11	0.70 ^{oo}
Burnout/ Emotional Exhaustion [#]	<u>1.07 ± 0.77</u>	0.73 ± 0.52	1.03 ± 0.65	0.31	0.44 ^o	0.04	0.47 ^o
Injury [#]	<u>2.55 ± 1.00</u>	1.97 ± 0.71	2.25 ± 0.98	0.26	0.58 ^o	0.30	0.28
SPORT-SPECIFIC RECOVERY MAJOR SCALE	<u>3.36 ± 0.78</u>	3.38 ± 0.86	3.56 ± 0.59	0.75	0.02	0.25	0.21
Being in shape	<u>3.26 ± 0.71</u>	3.45 ± 1.00	3.59 ± 0.55	0.56	0.20	0.47 ^o	0.14
Personal accomplishment	3.21 ± 0.88	<u>2.90 ± 0.92</u>	3.13 ± 0.84	0.63	0.34	0.08	0.26
Self-efficacy	<u>3.49 ± 0.77</u>	<u>3.49 ± 0.99</u>	3.80 ± 0.69	0.53	0.00	0.41 ^o	0.31
Self-regulation	<u>3.49 ± 1.03</u>	3.69 ± 0.86	3.70 ± 0.81	0.82	0.17	0.20	0.04

[#] Lower values represent better results

Values in **bold** depict the group with the best results for the particular subscale, whilst underlined values represent the group with the least favourable results

* Statistically significant differences ($p < 0.05$)

^o Moderate practical significant differences ($d \approx 0.5$)

^{oo} Large practical significant differences ($d \approx 0.8$)

Table 2 shows that the level of experience is age dependent, as the group of very experienced rugby players at this particular level of participation (23.15 ± 0.99 years) was significantly older than the novice players (21.05 ± 0.85 years). Similarly, the group of very experienced players (15.25 ± 1.66 years) had been participating in rugby for significantly longer than their less experienced (13.57 ± 2.06 years) and novice (12.71 ± 2.70 years) counterparts respectively. The less experienced group reported the lowest scores of the three groups for the *Total Recovery-Stress Score* and all of the *General* and *Sport-Specific Stress Major Scales* and *Subscales*. The novice players had the highest *General* and *Sport-Specific Recovery Scores* of the three groups, except for the *Physical Relaxation* item and the *Personal Accomplishment* subscale. To the best of our knowledge, no studies have been published in which the REST-Q scores of athletes with different experience levels have been compared, thereby limiting the extent to which the current results can be discussed.

From Table 3 it is evident that moderate practical significant ($d \approx 0.5$) differences exist for *Sport Devaluation* between the very experienced players (who had the highest values) and the novice players. Furthermore, the very experienced group had higher *Total Burnout*, *Reduced Sense of Accomplishment* and *Emotional/Physical Exhaustion* scores than the other groups,

albeit insignificantly so. In this regard Creswell and Eklund (2006a), revealed that professional New Zealand rugby players with greater national level experience reported significantly ($p < 0.05$) higher *Sport Devaluation* and *Emotional/Physical Exhaustion* scores than those players without such experience. Prolonged representation at a particular level, therefore, seems to increase a player's chances of burning out.

TABLE 3. COMPARISON OF THE ABQ AND STEMS SUBSCALES BETWEEN THE GROUPS OF VERY EXPERIENCED, LESS EXPERIENCED AND NOVICE PLAYERS

	Group 1 Very experienced players (≥ 3 years) (n = 12)	Group 2 Less experienced players (1 or 2 years) (n = 15)	Group 3 Novice players (0 years at this level) (n = 14)	Analysis of variance (ANOVA) Statistical significance (p-value)	Effect size results (Cohen's <i>d</i> - value)		
					Practical signifi- cance between Groups 1 & 2	Practical signifi- cance between Groups 1 & 3	Practical signifi- cance between Groups 2 & 3
TOTAL BURNOUT SCORE (ABQ) #	1.93 ± 0.65	1.77 ± 0.33	1.79 ± 0.33	0.63	0.24	0.22	0.04
Reduced Sense of Accomplishment #	2.30 ± 0.76	2.18 ± 0.41	2.26 ± 0.43	0.86	0.15	0.04	0.18
Sport Devaluation #	1.63 ± 0.67	1.44 ± 0.45	1.38 ± 0.37	0.42	0.29	0.38°	0.15
Emotional/Physical Exhaustion #	1.85 ± 0.64	1.70 ± 0.42	1.72 ± 0.37	0.68	0.25	0.20	0.06
TOTAL MOOD DISTURBANCE SCORE (STEMS)	-6.69 ± 11.66	-0.11 ± 8.03	-3.45 ± 10.37	0.25	0.56°	0.28	0.32
Tension #	3.38 ± 3.07	1.77 ± 1.66	2.97 ± 3.01	0.25	0.52°	0.13	0.40°
Depression #	2.61 ± 2.65	1.11 ± 1.33	1.77 ± 2.00	0.17	0.56°	0.32	0.32
Anger #	2.76 ± 2.21	1.34 ± 1.35	1.88 ± 1.91	0.14	0.64°	0.40°	0.29
Vigour	9.38 ± 2.21	9.00 ± 2.69	9.61 ± 1.47	0.75	0.14	0.10	0.23
Fatigue #	4.57 ± 1.63	3.62 ± 1.83	3.93 ± 1.29	0.32	0.52°	0.39°	0.17
Confusion #	2.76 ± 2.23	1.27 ± 1.16	2.52 ± 3.10	0.19	0.67°	0.08	0.40°

Lower values represent better results

Values in **bold** depict the group with the best results for the particular subscale, whilst underlined values represent the group with the least favourable results

° Moderate practical significant differences ($d \approx 0.5$)

The very experienced group consistently showed significantly greater ($d \approx 0.5$) *Total Mood Disturbance Score* and negative mood state scores (i.e., *Tension*, *Depression*, *Anger*, *Fatigue* and *Confusion*) than the less experienced group. Insignificant differences were also observed for the *Vigour* subscale, with the novice group showing the highest scores.

Previous research has shed light on the impact of players' experience levels on their burnout scores. Burnett (2003) noted that by becoming an established member of a team, a player's personal involvement deepens, resulting in stronger commitments and greater responsibility. According to Creswell and Eklund (2005), such additional responsibilities within the team include leadership roles and tactical decision making duties, which may contribute to an

imbalance between the perceived demands on the player and the capacity of the player to handle such responsibilities, thereby increasing the risk for burning out.

For the comparison involving starting status, only 23 players were included in the analysis (see the subsection on the subjects for inclusion criteria). Table 4 reveals that the regular starters were significantly older and had been playing rugby for longer than the reserves. The reserve players showed significantly better *Total Recovery-Stress* ($d = 0.46$), *General Recovery* ($d = 0.46$), *Sport-specific Recovery* ($d = 0.46$) and *Total Mood Disturbance Scores* ($d = 0.73$) scores than those in the starting line-up. In fact, the reserves had significantly better scores for all six Mood State subscales than those in the starting line-up.

The regular starters, however, had less *Sport-specific Stress* and lower *Sport Devaluation* and *Emotional/Physical Exhaustion* values than the reserves, albeit insignificantly so. Creswell and Eklund (2006a) previously found that players not in the starting line-up (2.35 ± 0.22) had significantly ($p = 0.025$) higher *Reduced Sense of Accomplishment* levels than those in the starting line-up (2.18 ± 0.21), but the current findings failed to substantiate these results.

TABLE 4. COMPARISON BETWEEN REGULAR FIRST TEAM STARTERS AND NON-STARTERS (RESERVES) FOR THE RESTQ-52 SPORT, ABQ AND STEMS SUBSCALES

	Regular 1 st team starters (n = 17)	Regular non-starters/reserves (n = 6)	T-test results Statistical significance (p-value)	Effect sizes Practical significance (Cohen's d)
Average age	22.92 ± 1.23	21.71 ± 1.98	0.09	0.61°
Average years playing rugby	14.53 ± 2.03	11.50 ± 3.94	0.02*	0.77°°
TOTAL RECOVERY-STRESS (RESTQ-SPORT)	3.56 ± 2.21	4.58 ± 2.24	0.34	0.46°
GENERAL STRESS MAJOR SCALE #	1.48 ± 0.82	1.26 ± 0.56	0.56	0.26
General Stress Minor #	1.29 ± 0.89	1.04 ± 0.77	0.55	0.28
Emotional Stress #	1.51 ± 1.10	1.21 ± 0.53	0.52	0.28
Social Stress #	1.51 ± 0.92	1.29 ± 0.66	0.59	0.24
Conflicts/Pressure #	2.09 ± 1.27	1.92 ± 0.80	0.76	0.14
Fatigue #	1.41 ± 1.00	1.33 ± 0.97	0.87	0.08
Item 6 - I had difficulties in concentrating #	1.56 ± 0.95	1.25 ± 0.76	0.48	0.33
Item 23 - I put off making decisions #	1.44 ± 1.12	0.83 ± 0.82	0.24	0.54°
Item 9 - I had a headache #	0.62 ± 0.74	0.75 ± 0.76	0.71	0.17
Item 12 - I felt uncomfortable #	1.41 ± 1.03	1.25 ± 1.08	0.75	0.15
GENERAL RECOVERY MAJOR SCALE	3.20 ± 0.75	3.63 ± 0.92	0.28	0.46°
Success	2.91 ± 0.80	3.04 ± 1.02	0.75	0.13
Item 2 - I laughed	3.35 ± 1.04	3.92 ± 1.20	0.29	0.47°
Item 8 - I had a good time with my friends	3.24 ± 1.40	3.75 ± 1.44	0.45	0.36°
Item 4 - I felt physically relaxed	2.59 ± 0.87	3.25 ± 0.61	0.10	0.76°°
Item 21 - I felt as if I could get everything done	2.91 ± 0.83	3.17 ± 1.47	0.61	0.17
General Well-being	3.26 ± 0.92	3.79 ± 1.12	0.27	0.47°
Sleep Quality	3.79 ± 0.96	4.25 ± 1.01	0.34	0.45°

	Regular 1 st team starters (n = 17)	Regular non-starters/reserves (n = 6)	T-test results Statistical significance (p-value)	Effect sizes Practical significance (Cohen's <i>d</i>)
SPORT-SPECIFIC STRESS MAJOR SCALE #	1.28 ± 0.78	1.35 ± 0.58	0.85	0.08
Disturbed Breaks #	0.92 ± 0.81	1.13 ± 0.63	0.58	0.25°
Burnout/ Emotional Exhaustion #	0.93 ± 0.77	0.98 ± 0.61	0.90	0.06
Injury #	1.99 ± 1.12	1.94 ± 0.74	0.91	0.05
SPORT-SPECIFIC RECOVERY MAJOR SCALE	3.11 ± 0.82	3.56 ± 0.97	0.28	0.46°
Being in shape	3.11 ± 0.85	3.67 ± 0.97	0.20	0.58°
Personal accomplishment	2.80 ± 0.86	3.29 ± 1.19	0.29	0.41°
Self-efficacy	3.23 ± 1.09	3.63 ± 1.03	0.45	0.36°
Self-regulation	3.31 ± 0.92	3.67 ± 0.91	0.42	0.39°
TOTAL BURNOUT SCORE (ABQ) #	1.81 ± 0.64	1.81 ± 0.35	0.99	0.00
Reduced Sense of Accomplishment #	2.31 ± 0.67	2.18 ± 0.43	0.67	0.19
Sport Devaluation #	1.49 ± 0.71	1.58 ± 0.47	0.77	0.13
Emotional/Physical Exhaustion #	1.62 ± 0.69	1.65 ± 0.41	0.93	0.04
TOTAL MOOD DISTURBANCE SCORE (STEMS)	-1.00 ± 11.25	7.25 ± 3.17	0.10	0.73°°
Tension #	2.15 ± 2.97	0.92 ± 0.74	0.33	0.41°
Depression #	1.35 ± 2.00	0.25 ± 0.42	0.20	0.55°
Anger #	1.35 ± 1.97	0.50 ± 0.84	0.32	0.43°
Vigour	8.24 ± 3.10	10.25 ± 1.70	0.15	0.65°°
Fatigue #	2.50 ± 2.08	1.00 ± 1.58	0.12	0.72°°
Confusion #	1.88 ± 2.79	0.33 ± 0.52	0.20	0.56°

Lower values represent better results

Values in **bold** depicts the group with the best results for the particular subscale

* Statistically significant differences (p<0.05)

° Moderate practical significant differences ($d \approx 0.5$)

°° Large practical significant differences ($d \approx 0.8$)

Collectively, the results from Table 4 suggest that the players in the starting line-up were subject to greater stress levels, had poorer recovery strategies and generally experienced greater negative mood state scores than the reserve players, whereas the reserves experienced greater stress of a sport-specific nature.

CONCLUSIONS

The results from this study show that playing position, experience level and starting status are related to the key characteristics of burnout, the recovery-stress balance and mood states, as significant differences in these scores were frequently observed between the various subgroups. Importantly, these differences do not imply prediction or causation.

In particular, it was observed that the forwards in the current investigation had more favourable REST-Q, ABQ and STEMS subscale scores than the backline players. The very experienced players (senior squad members) at this particular participation level showed the

least favourable REST-Q, ABQ and STEMS subscale scores throughout. Players with limited experience at this level (one or two years) had the most favourable *Total Recovery-Stress*, *General Recovery*, *Sport-specific Recovery*, *Burnout* and *Mood State* scores of the three groups in the comparison, whilst the novice players (first season at this level) showed the most favourable *General Recovery* and *Sport-specific Recovery* scores. Starting status were also shown to significantly affect the *Total Recovery-Stress*, *General Recovery Major Scale*, *Sport-specific Recovery Major Scale* and the *Total Mood Disturbance* scores with the reserves showing more favourable results than the regular starters.

RECOMMENDATIONS

From these findings it is recommended that different player management strategies should be developed and implemented for more experienced team members and regular starters. Playing position should also be considered when monitoring and managing rugby players regarding the possible onset and development of the overtraining and burnout syndromes.

This study used an availability sample consisting of 41 male student rugby players. The small number of participants potentially limits the ability to generalize these results to other populations, especially as this group was further divided into subgroups for the various comparisons. It is subsequently recommended that future studies include larger sample sizes comprising of players from different teams. The inclusion of players from different teams would enable comparisons between successful and less successful teams, thereby contributing to the existing knowledge of factors leading to the development of overtraining and burnout. Furthermore, it is suggested that this study is extended to professional rugby players competing at the provincial and/or international level, as these players are particularly prone to experience these syndromes due to year-round competitive seasons with short breaks in between.

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