MOOD STATES OF SOCCER PLAYERS IN THE ENGLISH LEAGUES: REFLECTIONS OF AN INCREASING WORKLOAD

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AUTHORS: Lovell G.P.[1], Townrow J.[2], Thatcher R.[3]

[1]Faculty of Sport, Health & Social Care, University of Gloucestershire, Gloucester, UK;
[2]School of Life Sciences, Roehampton University, London, UK;
[3]Department of Sport and Exercise Science, Aberystwyth University, Aberystwyth, UK

Reprint request to:
Geoff Lovell
Faculty of Sport, Health & Social Care
University of Gloucestershire at Cheltenham and Gloucester
Oxstalls Campus, Oxstalls Lane, Gloucester
Gloucestershire, UK, GI2 9HW
Email: glovell@glos.ac.uk

ABSTRACT: The aim of this investigation was to assess whether the demands of the modern English competitive soccer season would be reflected in the mood states of professional soccer players. Sixty-nine male participants either activity competing in English soccer leagues or resident in England were recruited and grouped accordingly as professional soccer players, university level soccer players, Sunday league soccer players, or non-sporting controls. On three separate occasions; at the beginning, at the middle, and finally towards the end of the English soccer season, participants completed both the Profile of Mood States (POMS) questionnaire as well as a questionnaire related to their teams' performance in addition to their perceived life stress. Results showed the POMS scores to differ over the season in relation to the groups' standard of competition. ANOVAs demonstrated this pattern to be significant for the dependent measures of tension, depression, and confusion with significant group by time interactions (95% level of confidence). At the outset of the season professionals had the most positive POMS profile, however, as the season progressed they showed the greatest change towards a negative profile. These results indicate that English soccer is placing professional players at a predisposition of demonstrating POMS commensurate with negative adaptation to training, having important implications for their long-term performance and health.

KEY WORDS: POMS, negative adaptation, training load

INTRODUCTION

Over the last decade or so, performances in most sports have increased dramatically as have the financial rewards and status of those performing at the very top level. As a result, many athletes have been placed under pressure to train at considerably higher levels than had previously been expected. In addition, traditional sporting seasons that allowed athletes to have rest periods have been replaced by year round training and competition. Researchers such as Raglin [19] have questioned the danger of this change and observed that "with longer competitive seasons and with increasingly extensive training practices, more individuals are placed at risk of experiencing performance problems…" (p. 840). An example of this extended season has become evident in the English soccer calendar. The professional soccer player in England not only has a busy domestic fixture list, but for many top class players, European and International fixtures add to this burden.

Extended competitive seasons are not the only change due to modern approaches to soccer. In order to increase performance, many players striving for elite status have employed increased training loads. Fry, Morton, and Kest [3] explain how an athlete's training program should present the body with "…a series of stimuli which will displace the homeostasis of the individual's functional systems and therefore provide the stimulus for adaptation" (p. 36). This adaptation is necessary in order for an improvement in performance to occur. It is important to note that once displacement has occurred, the individual requires a period of rest in order for the adaptation to occur and the homeostatic balance to be restored. If this is achieved, when the same stressor is presented to the individual on a further occasion, displacement of homeostasis will be to a lesser extent. As a result of this, and in order for the athlete to continue to improve, further and more severe stressors must be introduced. This principle of training is often referred to as overload.

Many researchers have attempted to investigate the effect that training at high intensities, and more specifically the application of the overload principle has on athletes [16,17]. Hooper and Mackinnon [4] were concerned that "while attempting to maximize training benefits, athletes may become overtrained" (p. 321). Kreider, Fry, and O'Toole [11] defined overtraining as: 'An accumulation of training and non-training stress resulting in long-term decrement in performance capacity with or without related physiological and psychological signs

and symptoms of overtraining in which restoration of performance capacity may take several weeks or months.' (p. viii).

Immunological status, as evidenced through infection rates, has long been associated with overtraining [12,18] and is known to be affected by exercise, environment, lifestyle, nutrition and psychological stress [10]. While infections of the upper respiratory tract are no more than a nuisance to sedentary individuals, they could pose

a serious problem for athletes; interfering with both competition performance and training.

The majority of investigations into the occurrence of overtraining have focused on individual sports, however, Bury, Marechal, Mahieu, and Pirnay [2] reported on the occurrence of Upper Respiratory Tract Infections (URTI) in 15 professional soccer players over the course of a competitive season. While a control group suffered a total of 9 URTI the soccer players suffered from 22 episodes indicating an increased susceptibility to infection.

It is generally accepted that high intensity, long duration, exercise in the absence of adequate recovery has a negative impact on immune function. When investigating the impact of soccer on the immune system Bishop, Blannin, Robson, Walsh, and Gleeson [1] reported that the changes in various markers of immune function were minimal following a soccer-specific exercise protocol. It would therefore appear that the physical exercise involved in soccer match play would not result in the increase in URTI reported by Bury et al. [2].

As athletes and coaches push for higher standards it is important that they must be aware of all the stressors that can have a negative effect on both performance and well being. These stressors, including negative adaptations to training, extended competitive season, and life stressors [7] should be monitored in order to identify athletes in danger of overtraining. Many researchers [5,9,13] agree that one of the main areas in which the sum of these stressors, and, possible negative affects may be monitored, is through a change in the athlete's psychological state. Hooper et al. [5] in discussing overtraining argue that "…the syndrome is characterized by negative affective states such as anxiety, depression, fatigue, anger and lack of self-confidence" (p. 2). Furthermore, Terry [22] suggests that mood disturbances usually accompany, and frequently precedes, the negative physiological effects of overtraining. As a result of this, attempts have been made to utilize psychological tools in both monitoring and identifying overtrained athletes [24]. One such tool, which has been relatively successful, is the Profile of Mood States questionnaire (POMS) [14]. The POMS questionnaire uses 65 adjectives to provide a measure of six subscales of mood; tension, depression, anger, vigour, fatigue, and confusion. Research such as that carried out by Morgan [15] has suggested that elite and successful athletes present an 'iceberg profile' in that below norm average scores are obtained in tension, depression, anger, fatigue, and confusion subscales, with above average scores for vigour. In comparison to this, athletes experiencing negative adaptations to training often display an 'inverse iceberg profile'.

As mentioned previously, a number of studies have utilized mood state questionnaires to monitor the impact of training loads and overtraining on psychological states [4,6,8,16]. These previous studies have examined individual sports (primarily swimming) whilst team sports such as soccer have been largely ignored. It is therefore possible that individuals within a team may not be observed as presenting negative adaptations to training as other team members may compensate for their performance decrements. Therefore, the POMS questionnaire could provide a method of monitoring individuals within a team for negative adaptations and highlighting individuals susceptible to overtraining, as has been reported for individual sports.

With regards to professional soccer in England, it seems possible that the increased frequency of games, and duration of the competitive season, increases the risk of negative training adaptations ultimately explaining the compromised immune status as identified by Bury et al. [2]. A soccer player that merely plays for recreational reasons will have different priorities in relation to performance, training and other aspects of their life. We therefore hypothesise that the higher the level of performance, and commensurate competition and training stress, the greater the susceptibility to negative training adaptation. In fact Sanderson [21] comments that; "Competitive soccer generates considerable stress, exposing many players and coaches to a chronic level of stress which can lead to burnout" (p. 291).

Thus the aim of this investigation was to assess whether professional soccer players presented POMS commensurate with extensive competition and training demands as compared to lower standards of soccer players and non-active individuals as a soccer season progressed. Such findings would have important applied implications for the care and monitoring of professional soccer players in the attempt to prevent overtraining and concomitant affects upon long-term performance and health.

MATERIALS AND METHODS

For this investigation the independent variable was the standard of play; professional, university level, Sunday league, and control (not involved in any type of competitive sport). The dependent measures were the six subscales of the POMS.

Participants. Sixty-nine males, either activity competing in English soccer leagues or resident in England, participated in this investigation: 17 professional soccer players (mean age 25 years, SD 4.96), 18 university soccer players (mean age 21 years, SD 3.03), 17 Sunday league soccer players (mean age 25 years, SD 4.37) and 17 control individuals who did not take part in any type of competitive sport (mean age 24 years, SD 5.82). A requirement for soccer players' inclusion for this study was that they were constantly engaged in competitive play and were injury free for the duration of the data collection.

For each of the soccer standard groups; professional, university, and Sunday league, players were drawn from individual teams. The rationale for this method of participant selection was one of access; professional soccer players have many constraints upon their time which often makes it difficult for researchers to gain entry enabling the collection of meaningful data. The primary data collecting researcher in this paper, spent much time gaining the trust of

the soccer players through being present in training and competition situations prior to data collection. If this was to have been undertaken for other professional teams the time limitation would have rendered this research impractical. Obviously, this does limit the generalizability of any findings from this research, however, due to the novelty of this investigation, it was felt that this was an acceptable delimitation.

Apparatus. The POMS questionnaire was used to obtain mood scores of tension, depression, anger, vigour, fatigue, and confusion. The questionnaire contains 65 adjectives each of which are rated on a scale of 1 ('not at all'), to 4 ('extremely'). All participants completed the questionnaire independently and as honestly as possible in relation to how they had been feeling over the past week, including the day of testing.

Further information regarding aspects such as the participant's teams' performance and their perceived life stress was also collected via questionnaire. The purpose of these data was to control for other variables in addition to training load and competition schedule which may have also influenced the players' POMS profiles.

Procedure. Following informed consent, all participants were required to complete the POMS and the team performance / life stress questionnaire on three separate occasions related to the beginning (August), mid-point (December), and finally towards the end of the English soccer season (April). On each occasion, soccer participants' testing was carried out following a training session. This was to ensure that the participants were in a similar state of mind for all three testing sessions and also to minimize the effect of other possible variable factors such as the player's response to the outcome of a game.

Treatment of data. Questionnaire data regarding the participants' teams' performances and their perceived life stress across the three data collection points of the season were examined by repeated measures ANOVAs.

For each of the six POMS variables, a 4(group: professional, university, Sunday league, control) × 3(time in season: early, mid, late), mixed design ANOVA with repeated measures on the last factor was carried out. Due to the number of ANOVA's conducted, to counteract for an inflated alpha and thus possibility of type I error, significance was set at the 95% level of confidence with an appropriate Bonforoni correction applied to the critical p value ($p<0.0083$).

RESULTS

It is important to note at this point that the performance of the teams representing the different levels of competitive standard, were all similar: professional team 60%, university team 63%, and Sunday league 50%. (Performance was measured as number games won divided by the number games played, multiplied by 100). As equally

TABLE I. MEAN AND STANDARD DEVIATION POMS SCORES FOR EARLY, MID AND LATE SEASON FOR SOCCER PLAYERS AND CONTROLS

POMS Subscale	Group			
	Professional	University	Sunday league	Control
Tension				
Early	6.88 (3.57)	8.28 (4.25)	9.06 (6.02)	12.12 (6.19)
Mid	12.43 (5.46)	12.57 (5.52)	9.20 (5.31)	10.35 (4.14)
Late	12.00 (6.35)	10.85 (3.67)	11.08 (5.70)	10.63 (4.75)
Depression				
Early	5.76 (4.04)	10.17 (9.39)	11.00 (9.75)	12.94 (11.19)
Mid	17.36 (16.84)	17.07 (9.56)	11.93 (9.85)	9.76 (7.38)
Late	16.17 (11.59)	15.92 (9.52)	12.42 (10.77)	12.38 (12.62)
Anger				
Early	9.76 (5.39)	10.06 (7.26)	13.76 (12.29)	14.76 (9.61)
Mid	17.00 (11.77)	16.50 (8.99)	10.67 (9.12)	11.00 (6.91)
Late	15.08 (9.40)	16.31 (7.31)	12.00 (7.56)	13.63 (9.88)
Vigour				
Early	20.53 (5.76)	18.61 (3.50)	17.06 (5.60)	14.41 (5.00)
Mid	18.29 (5.93)	15.86 (2.07)	15.53 (5.80)	14.24 (5.51)
Late	16.42 (5.26)	17.38 (5.36)	13.00 (4.94)	13.94 (5.27)
Fatigue				
Early	8.47 (5.37)	7.28 (3.34)	12.82 (7.30)	11.35 (6.98)
Mid	11.21 (5.39)	12.14 (5.17)	12.20 (7.62)	9.59 (4.90)
Late	12.17 (9.66)	9.77 (3.88)	15.25 (6.37)	10.38 (6.21)
Confusion				
Early	4.64 (4.07)	7.61 (2.73)	9.18 (6.52)	11.24 (5.97)
Mid	9.79 (6.05)	12.07 (3.43)	9.67 (6.18)	10.35 (5.37)
Late	9.83 (5.52)	10.23 (3.44)	9.92 (4.70)	9.13 (5.60)

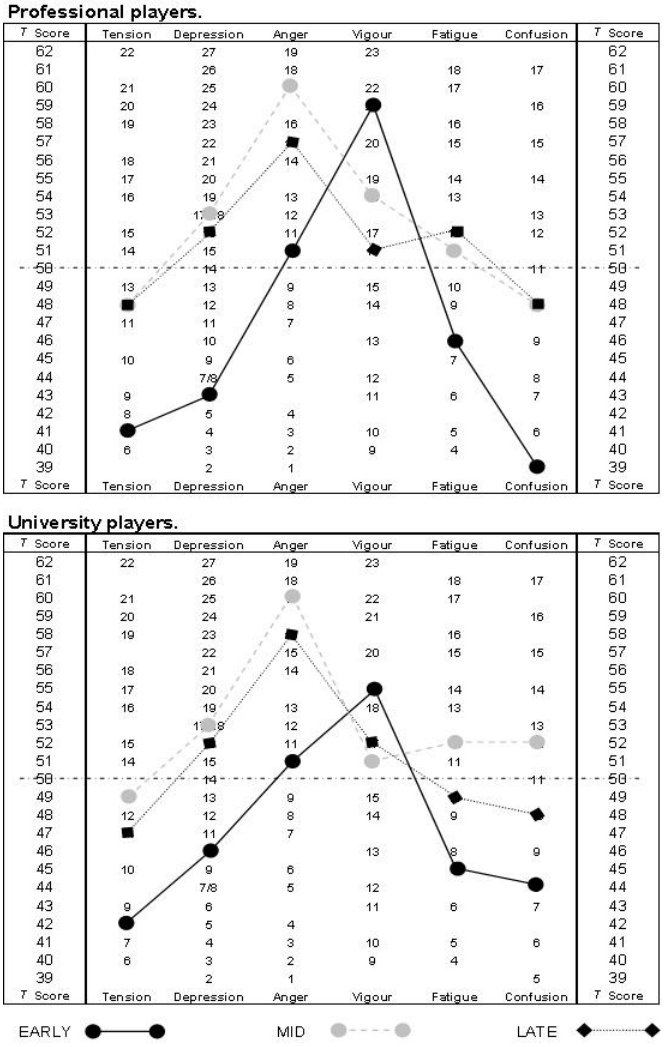

FIG. 1. PROFESSIONAL PLAYER'S (TOP) AND UNIVERSITY PLAYERS' (BOTTOM) MEAN POMS SCORES FOR EARLY, MID AND LATE SEASON.

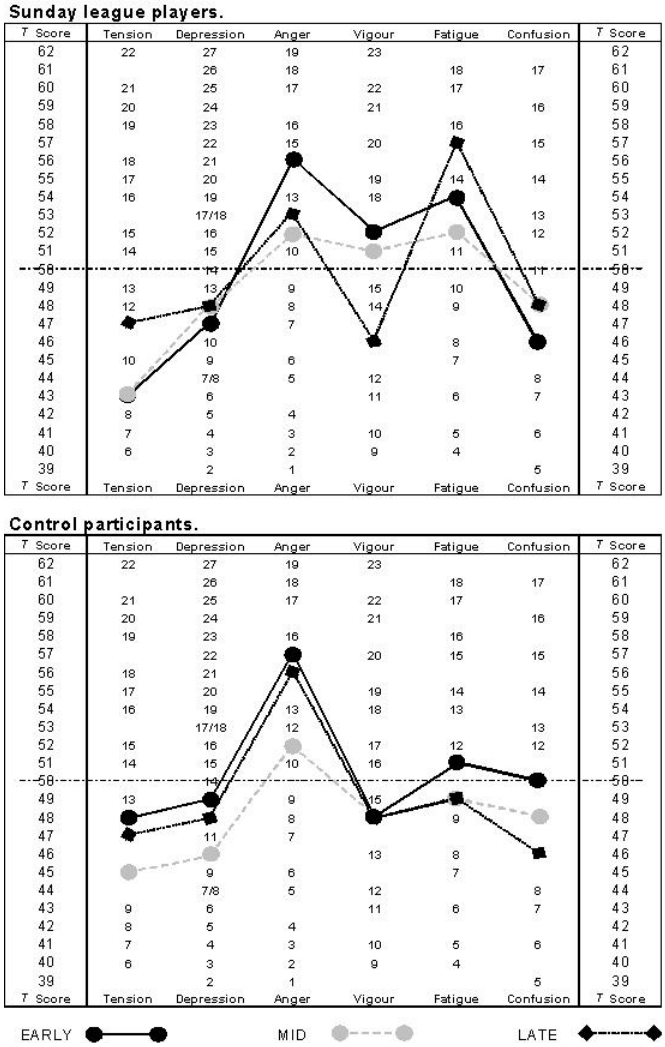

FIG. 2. SUNDAY LEAGUE PLAYERS' (TOP) AND CONTROL PARTICIPANTS' (BOTTOM) MEAN POMS SCORES FOR EARLY, MID AND LATE SEASON.

as important for the validity of this study was that no significant differences where seen across the season for participants' perceptions of life stress.

Figs. 1 and 2 represent the mean POMS profiles during early, mid and late season testing for each competitive standard group. The means and standard deviations of the six POMS subscales for each group, at each point in the season are shown in Table 1.

As apparent in Figs. 1 and 2, there are two major observations of interest. The first is that early in the season the higher the competitive standard the more positive and 'iceberg' like the POMS. In Fig. 1 for the professional players early in the season, there is a high score for vigour, with relatively low scores for tension, depression, fatigue, and confusion, presenting an iceberg like profile. The extent of this iceberg profile then diminishes as the standard of play decreases; ultimately Fig. 2 for the control subjects demonstrates levels of tension, depression, fatigue, and confusion similar to the levels of vigour, with an even higher level of anger. Secondly, as the season progressed the lower the competitive standard of soccer, the less the profile changed, however, for the professional players, the profile changed dramatically becoming much less positive. This differential change in the profiles of each group can be seen as a marked between group difference of the within group differences for the profiles of early, mid, and late season. For the professional players (Fig. 1) scores for positive factors such as vigour dramatically decreased, and negative factors such as tension and confusion dramatically increased. Fig. 1 for the University players demonstrated a similar but less marked change, with the Sunday league players and the control group (Fig. 2) demonstrated only small within group changes of profile.

When examining the individual POMS subscales, these observations are presented with further support. If Table 2 representing the statistical results is considered, it can be seen that group by time interactions are significant for the subscales of tension $F_{6, 98} = 2.95$, $p<0.05$, depression $F_{6, 98} = 3.34$, $p<0.05$, and confusion $F_{6, 98} = 3.64$, $p<0.05$. For each of these subscales the same trend was apparent; at the early stage of the season the higher the standard of the group the more positive the POMS subscale score, however by the end of the season, the higher the standard of the group, the less positive the POMS subscale score.

Although not significant at the 95% level of confidence, anger, vigour, and fatigue subscales all demonstrated similar but less

TABLE 2. MAIN EFFECTS AND INTERACTIONS FOR THE SIX POMS SUBSCALES

POMS subscale	ANOVA contrast					
	Group main effect[a]		Time main effect[b]		Interaction[c]	
	F	*p*	*F*	*p*	*F*	*p*
Tension	0.50	0.687	3.61	0.031	2.95	0.008*
Depression	0.40	0.753	6.17	0.003*	3.34	0.005*
Anger	0.92	0.440	0.93	0.398	1.93	0.083
Vigour	4.29	0.008*	4.38	0.015	0.96	0.455
Fatigue	1.58	0.207	1.83	0.166	2.70	0.018
Confusion	0.74	0.531	3.49	0.034	3.64	0.003*

[a]DF = 3 and 49. [b]DF = 2 and 98. [c]DF = 6 and 98. *Significant at 95% level of confidence ($p < 0.0083$).

extensive trends than the data for the tension, depression, and confusion subscales. Furthermore, as shown in Table 2 several main effects for time and group prove to be significant at the 95% level of confidence. However, as these effects are often disguised by significant interactions [23] and that main effects are not the major point of interest in this study, they will not be discussed at any length.

DISCUSSION

The two major points of interest apparent in the results were; firstly that the professionals appeared to have the more positive mental health profiles at the start of the season. Secondly, that the higher the competitive standard of the group, the greater the detrimental change in mood states over the course of the season.

With regard to the first point, there being differences between the competitive standard groups in their POMS profiles, researchers such as Morgan as early as 1979 [15] successfully used the POMS questionnaire to identify more successful elite athletes from less successful elite athletes through their overall profile. At the start of the season, mean profiles of each group appeared to agree with Morgan's findings: The professionals, the highest competitive standard studied, clearly showed a more positive profile than the recreational and control groups. In fact, the professionals appeared to present an 'iceberg profile' with lowest normed scores for most of the negative affective states which was accompanied by a highest score for vigour. An explanation of this observation may be that the higher standard players benefited from a more active life style at this point, but without the negative effects of excessive training loads as they were at the start of the season, being recovered due to their recent off-season. If it were that the professionals in this investigation had an extend international season which would have run into what would otherwise be the off-season, it may have been expected that they would not have demonstrated such a positive profile at the start of the season. Other researchers [20] have obtained results which are contrary to these findings. Riddick reported that recreational swimmers had more positive profiles than competitive or inactive swimmers. An explanation of Riddick's results may have been that the higher standard of swimmer in his sample were in a state of training more similar to the professional soccer players of this study during the mid to late stages of the season.

In terms of changes in profile, as the season progressed distinctions between groups in terms of elite and non-elite players, particularly for the moods of tension, depression, and confusion were in accordance with prediction from previous studies, demonstrating significant group by time in season interactions. For these three moods, and to a large but non-significant fashion for the remaining moods, the higher the standard of player, the greater the reduction in positivity of the scores. However, of particular importance was the fact that changes were greatest for the professional players and least for the control participants. This suggests the changes observed were more to do with the demands of the soccer players' season, rather than factors related to a population as a whole.

While other indicators of negative adaptation to training, including infection rates, were not included in the current study changes in POMS suggest that the modern game of soccer in England predisposes players of the higher standard to a change in profile that could be interpreted as commensurable with negative adaptation. Previous work would suggest that the physiological demand of match play could not account for the changes in immunological status and increase in URTI [1]. However the current study may suggest that the extended competitive season, increase in competitive stress, and increased training load could result in a change in POMS which could impact on the occurrence of URTI. It may also be that professional players are also under pressure from other sources of stress that could play impact on mood states.

Unfortunately, due to limited research in this area, these conclusions may appear speculative, supporting the contention that this area is in need of further directed research. Application of such further findings may include the design of player support programs aiming to enhance performance and well being. Furthermore, such investigations could provide additional information regarding the suitability of the POMS to monitor athletes from sports such as soccer, which are of medium duration and team based, for symptoms of ensuing negative adaptation. Such a tool would be of great use in the applied setting when attempting to prepare for, and maintain, high levels of competition.

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