Profile of stress-recovery state and burnout as a function of performance level among international youth table tennis players

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Abstract: This study was designed to test among elite youth table tennis players if athletes of different levels of performance differ with regard to stress, recovery and burnout variables. Results show distinct profiles of stress, recovery and burnout between high *versus* low performance levels. Implications for diagnosis and training are discussed.

Keywords: Burnout, stress, recovery, performance, youth elite athletes.

1. INTRODUCTION

Burnout is conceptualized as the result of chronic exposure to stress and insufficient recovery leading to detrimental consequences such as difficulties in motivation, poorer coping behavior, drastically performance decrements and/or dropout of sport (1). This theoretical approach and the empirical evidence suggest that assessing an individual recovery-stress state might have value for monitoring training and preventing burnout (2). Youth elite athletes seem particularly vulnerable to burnout because of the high demands they must cope in their everyday life (e.g., overloaded with practice and training time, pressure to win by significant others) (3). Because losses resulting from the early retirement of young elite athletes, possibly due to burnout, ensue from an individual unfulfilled human potential and lower national team programs, it could be useful to identify athletes with particular recovery-stress states (i.e., deviation from those expected based on individual or group profiles).

The purpose of this study was to identify different profiles of athletes in regards to stress, recovery and burnout, as a function of performance level (high vs. low) in order to help coaches to prevent the apparition of burnout among youth elite table-tennis players (2).

2. METHODS

Participants

Forty-five (20 males and 25 females) youth international table tennis players (M age = 14.83 year, SD = 2.00; M hours of training per week = 22.52, SD = 4.11) voluntarily participated in this study. Participants completed 2 to 5 times (28 athletes 4 times and 14 athletes 5 times) questionnaires with delay of one month between each completion, resulting in 190 subjects.

Measures

The French REcovery STress Questionnaire for athletes (RESTQ-Sport, 2) provides a picture of current recovery-stress state. It includes general dimensions concerning stress and recovery, as well as specific dimensions which aim at addressing more details of the stress and recovery processes from a physical (somatic), emotional, behavioral and social perspective (2). In addition, global indexes of stress and recovery which correspond respectively to the sum of the 10 stress subscale scores (general stress, emotional stress, social stress, fatigue, lack of energy, conflicts/pressure, somatic complaints, disturbed breaks, emotional exhaustion and fitness/ injury) and the 8 recovery subscale scores (success, somatic relaxation, general well-being, sleep quality, fitness/being in shape, personal accomplishment, self-efficacy and self-regulation) and a global index of stress-recovery state representing the total score of recovery minus the total scores of stress were also used in this study (2). The version used in the present study consisted of 71 items: 17 scales with 4 items each plus one scale (i.e., conflicts/ pressure) with 3 items. A Likert-type scale was used with values ranging from 0 (never) to 6 (always) indicating how often the respondent participated in various activities during the preceding three days and nights. Alpha coefficients varied from 0.65 to 0.85 (except for the success subscale, $\alpha = 0.56$), indicating adequate reliability.

The French version of the Athletes Burnout Questionnaire (4) was used to assess athlete burnout. It contains three 5-item subscales designed to measure: (a) reduced sense of accomplishment (e.g., “It seems that no matter what I do, I don’t perform as well as I should”), (b) sport devaluation (e.g., “I have negative feelings towards sport”), and (c) emotional/physical exhaustion (e.g., “I am exhausted by the mental and physical demands of my sport”). Participants responded on a five-point Likert scale with values ranging from 1 (almost never) to 5 (most of the time). Consistent with previous reports, internal consistency was adequate in the present investigation with alphas of 0.91, 0.82 and 0.71 for the exhaustion, sport devaluation and reduced accomplishment subscales, respectively.

Finally, athletes and coach of each athlete completed the item measuring the performance’s level of the past month using a Likert type scale with values ranging from 1 (very low performance level) to 10 (very high performance level). A global score of performance level was used by adding athlete’s and coach’s responses.

Procedure

Following ethics approval from the institutional research ethics board, coaches from each team were contacted to obtain permission to approach their athletes for participation in the study. The athletes' participation was voluntary, written informed consent was obtained from each individual prior to data collection, and the athletes' anonymity was ensured. Participants completed the RESTQ-Sport, the ABQ and the athletes' performance's level in individual or collective (with a maximum of 15 athletes simultaneously) sessions.

Statistical analyses

One hundred and ninety subjects were split into two groups depending on their global performance level scores (high performance level group > 13 *vs*. low performance level group < 12). We examined if stress, recovery and burnout would differ across the two groups using MANOVA with subsequent univariate ANOVAs (standardized scores of stress, recovery and burnout subscales were used).

3. RESULTS

Results of a MANOVA yielded a significant multivariate effect on the dependent variables as a whole (Wilk's Lambda = 0.70, $F_{(21,103)} = 2.10$, $p < .01$, $\eta 2 = 0.30$). The results of univariate ANOVAs indicated that 11 variables differed significantly across the two subgroups of athletes: 5 stress variables (general stress, emotional stress, conflicts/pressure, lack of energy, global index of stress), 4 recovery variables (general well-being, sleep quality, self-efficacy, global index of recovery), the global index of stress-recovery state and 1 burnout variable (reduced sense of accomplishment). Results are presented in Figure 1.

4. DISCUSSION

Distinct profiles of stress, recovery and burnout have been identified between high performance level group and low performance level group among international youth table tennis players. Knowledge of the distinct profiles of athletes based on their stress, recovery and burnout responses would help the practitioner in the screening, diagnosis and intervention with performers.

According to the pattern of stress, recovery and burnout scores of the performer, sport psychologists and practitioner should develop appropriate interventions (e.g., goal settings, self-talk, cognitive restructuration) to prevent the apparition of burnout on youth elite athletes.

In conclusion, to observe longitudinally individual or groups of youth table tennis players through completion of RESTQ-Sport could allow coaches and practitioners:

(a) To prevent the apparition of burnout, and

(b) To implement appropriate interventions to youth elite athletes.

REFERENCES

[1] Kallus, K.W. and Kellmann, M. Burnout in athletes and coaches, in Y.L. Hanin (Ed.), Emotions in sport, pp. 209-230, Champaign, IL: Human Kinetics, 2000.

[2] Kellmann, M. and Kallus, K.W. *Recovery-stress questionnaire for athletes: user manual*. Champaign, IL: Human Kinetics, 2001.

[3] Goodger, K., Gorely, T., Lavallee, D. and Harwood, C. Burnout in sport: a systematic review, *The Sport Psychologist*, 21, 127-151, 2007.

[4] Isoard-Gautheur, S., Oger, M., Guillet, E. and Martin-Krumm, C. Validation of a French version of the Athlete Burnout Questionnaire (ABQ) in competitive sport and physical education context, *European Journal of Psychological Assessment*, 26, 203-211, 2011.

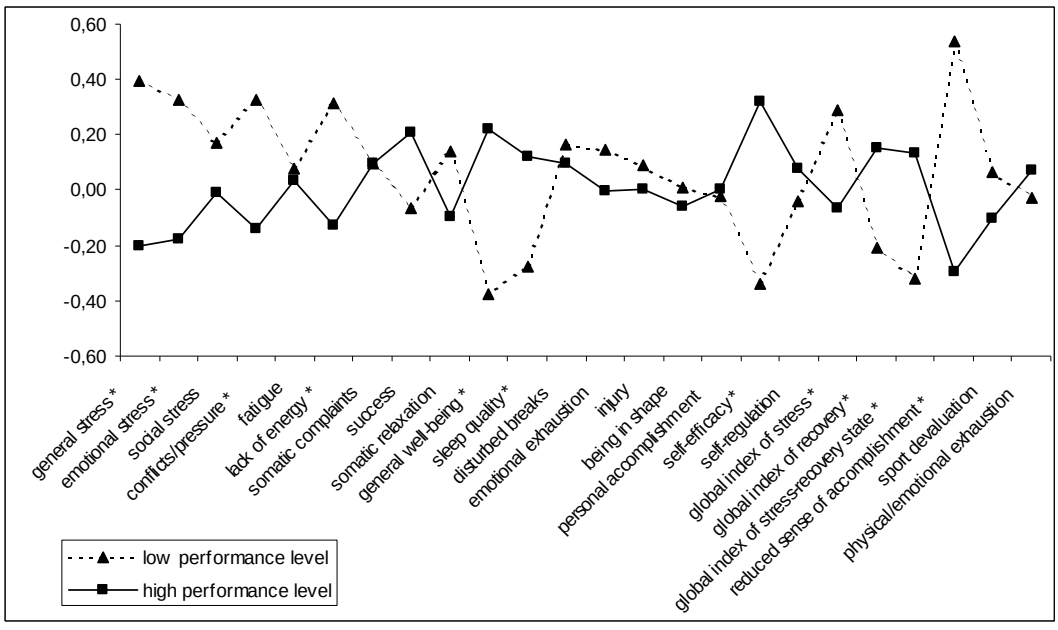

Fig 1. Stress, recovery and burnout scores as a function of performance levels (high vs. low), * p < 0.05