Prevalence of Nonfunctional Overreaching/Overtraining in Young English Athletes

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ABSTRACT

MATOS, N. F., R. J. WINSLEY, and C. A. WILLIAMS. Prevalence of Nonfunctional Overreaching/Overtraining in Young English Athletes. *Med. Sci. Sports Exerc.*, Vol. 43, No. 7, pp. 1287–1294, 2011. **Purpose**: Nonfunctional overreaching and overtraining (NFOR/OT) in adults can lead to significant decrements in performance, combined with physical and psychological health problems. Little is known about this condition in young athletes by comparison; thus, the aim of the study was to assess the incidence and symptomatology of NFOR/OT in young English athletes. **Methods**: Three hundred seventy-six athletes (131 girls and 245 boys, age = 15.1 ± 2.0 yr) completed a 92-item survey about NFOR/OT. The sample included athletes competing at club to international standards across 19 different sports. Athletes were classified as NFOR/OT if they reported persistent daily fatigue and a significant decrement in performance that lasted for long periods of time (i.e., weeks to months). Data were analyzed using the Mann–Whitney *U* and the Kolmogorov–Smirnov nonparametric tests. Significant predictors of NFOR/OT were identified using logistic regression analysis. **Results**: One hundred ten athletes (29%) reported having been NFOR/OT at least once. The incidence was significantly higher in individual sports ($P < 0.01$), low–physical demand sports ($P < 0.01$), females ($P < 0.01$), and at the elite level ($P < 0.01$). Training load was not a significant predictor of NFOR/OT; however, competitive level and gender accounted for a small (4.7% and 1.7%, respectively) but significant explanatory variance of NFOR/OT ($P < 0.05$). **Conclusions**: Approximately one-third of young athletes have experienced NFOR/OT, making this an issue for parents and coaches to recognize. OT is not solely a training load–related problem with both physical and psychosocial factors identified as important contributors. **Key Words:** MALADAPTATION, TRAINING LOAD, SYMPTOMATOLOGY, PSYCHOSOCIAL ISSUES, RISK FACTORS

Young athletes with the aspiration to become elite-level performers engage in rigorous training schedules to optimize their performance. This form of conditioning may involve an intensive training program that requires several hours of training per day (16). However, this pressured schedule often leaves little opportunity for recovery as part of the athletes' training plan. If recovery is insufficient and other sources of nontraining stress are present, it may lead to maladaptive responses called overtraining (OT) syndrome (2), staleness (17,23), nonfunctional overreaching (NFOR) (27), or burnout (8).

A defining characteristic of OT is a decrease in the ability to perform at established levels, which may persist for several weeks to months (3,16,23,28,30). In addition, OT is associated with a range of symptoms that often vary considerably across individuals, making it difficult to find a single diagnostic tool that will enable a definitive diagnosis. Nevertheless, some symptoms are more commonly reported than others: mood disturbances (22,29), increased perceptions of effort with training and competition (16), increased incidence of upper respiratory tract infections, loss of appetite, unexplained weight loss, sleep disturbances, and feelings of depression (2,7,32,35).

OT affects both endurance and nonendurance athletes (22), but few empirical data are available regarding incidence rates both in adult and youth athletes. Incidence of OT for adult athletes in individual sports has shown a wide variation; however, this is possibly due to the duration of assessment. Lower range estimates (~10%–20%) were based on samples of single training seasons/cycles (14,29,31), whereas higher rates (around 60%) are seen in studies that assessed entire athletic careers (30), indicating that incidence is positively associated with the duration of participation. Approximately 10% of collegiate swimmers and wrestlers have reported to become overtrained during a training season/cycle (29), although rates of 21% have been noted in swimmers (14,31). Conversely, much higher rates were reported in elite US distance runners; 60% of women and 64% of men reported being overtrained at some point in their career (30). Interestingly, the rate dropped to 33% in nonelite women runners, a difference attributed to

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the greater training distance performed by the elite runners (30). In comparison, little is known regarding the incidence in youth athletes. A multicenter survey based on 231 adolescent swimmers (14.8 ± 1.4 yr) across four different countries (Japan, United States, Sweden, and Greece) found that 35% had been overtrained at least once (35). A similar incidence rate was found by Kenttä et al. (19) in older Swedish athletes (N = 272, mean age = 17.9 yr), with 37% of the athletes overtrained at least once in their sports careers. Recently, Gustafsson et al. (12), on the basis of the survey of Kenttä et al. (19), also found that approximately 10% of competitive adolescent athletes (N = 980, mean age = 17.5 ± 0.1 yr) reported high burnout scores.

Information about the incidence, present symptomatology, and potential antecedents of NFOR/OT in children is scarce, and several important questions are still unanswered—At what age can NFOR/OT develop? Which age shows the highest incidence? Also, the differences between individual and team sports, low– and high–physical demand sports, gender, and competitive levels have not been sufficiently investigated. Previous studies found that OT incidence is higher in individual sports (19) and is more evident at higher competitive levels (30). The key role of training load in the development of a maladaptation has recently been challenged (12,26), emphasizing that psychosocial stressors are also strong contributing factors, despite many authors claiming that excessive training load is the essential factor in inducing a state of OT (2,14,23,24,38). In light of the lack of clarity surrounding this condition, the aim of this project was to assess the incidence, symptomatology, and associated factors of NFOR/OT in young athletes.

METHODS

Three hundred seventy-six young English athletes (245 boys and 131 girls) from 19 different sports, spanning club- to international-level athletes, volunteered to participate in the study. The mean age of the participants was 15.1 ± 2.0 yr (range = 11–18 yr). The study was approved by the institutional ethics committee before commencement. Informed consent and assent were obtained from parents, coaches, and children, respectively.

The survey was formulated on the basis of work from previous studies (10,19,35); items relating to training load, OT past experiences, frequency and duration of episodes, physical issues, and psychosocial factors were adapted from the previous questionnaires. A pilot study (N = 60, age = 15.7 ± 2.3 yr) was conducted to determine the appropriateness, grammatical correctness, comprehension, and clarity of the proposed survey. Personal contact was made with coaches and athletes before the questionnaire was completed to facilitate an adequate response rate (11). The final survey included six sections related to the athletes' sports background, physical symptoms, psychological symptoms, psychosocial pressures, and NFOR/OT prevalence. A five-point Likert scale was used to rate the frequency and strength of agreement or disagreement for statements. Sports were categorized as individual or team sports and low– or high–physical demand sports according to the classification of Ainsworth et al. (1) (low physical demand = METs ≤ 6 and high physical demand = METs > 6), and competitive level was categorized as club, county, regional, national, or international standard.

The definition of NFOR/OT used to classify athletes was derived from Kenttä et al. (19) but was adapted to be more conservative—Have you ever experienced a significant decrement in performance that persisted for long periods of time (i.e., weeks to months) although you kept training and you felt extremely tired everyday? Athletes were categorized as NFOR if the episode(s) lasted from 2 wk to 6 months and overtrained if the episode(s) lasted for >6 months. The athletes were requested to indicate how many episodes they had experienced in the past, the duration of each episode, and if they were experiencing one at the time of answering the questionnaire. Finally, the athletes who reported being NFOR/OT were asked if during the episode they kept their motivation to keep training because this is thought to provide a better understanding of the stage of OT the athlete has experienced (33,35).

Statistical analysis. Descriptive statistics are reported as mean ± SD. Differences between the NFOR/OT and normal athletes (NORM, athletes who were not classified as NFOR/OT) were determined using Mann–Whitney U nonparametric tests, and differences within the NFOR/OT group were determined using the Kolmogorov–Smirnov nonparametric test. Finally, a logistic regression analysis was performed to determine significant predictors of NFOR/OT from the following variables: age, gender, hours of training per day, days of training per week, years of competing in sport, and competitive level. These variables were selected to discriminate between the discrete influences of each of these interrelated factors in contributing to the occurrence of NFOR/OT. The level of statistical significance was set at $P < 0.05$.

RESULTS

Descriptive Statistics

Two hundred twenty-four athletes (60%) were individual-sport players, and 152 (40%) were team-sport players. The survey included 24% of athletes (n = 91) competing at club level, 23% at county level (n = 87), 14% at regional level (n = 54), 24% at national level (n = 91), and 14% at international competitive level (n = 53). The time spent training and competing in their sport ranged from 4 to 8 yr.

NFOR/OT Incidence

A total of 110 athletes (29%) self-reported being NFOR/OT at least once in their sporting career. There were no

TABLE 1. Incidence of NFOR/OT across different sports, for individual- and team-sports and low– and high–physical demand sports athletes.

Sport	Total Number	NFOR/OT
Football (10 METs)	83	12
Athletics (13 METs)	54	13
Cycling (13 METs)	47	23
Swimming (9 METs)	32	16
Field hockey (8 METs)	27	2
Rugby (10 METs)	26	9
Tennis (8 METs)	23	7
Squash (12 METs)	20	7
Gymnastics (4 METs)	18	9
Golf (4 METs)	13	4
Netball (4 METs)	8	3
Cricket (5 METs)	5	1
Eventing (4 METs)	5	2
Martial arts (10 METs)	4	2
Rowing (12 METs)	3	0
Dance (5 METs)	3	0
Lacrosse (8 METs)	2	0
Fencing (6 METs)	1	0
Off-road (4 METs)	1	0
Basketball (8 METs)	1	0

The MET classification used the definitions of Ainsworth et al. (1): low physical demand = METs ≤ 6 and high physical demand = METs > 6.

significant differences ($P > 0.05$) between the NFOR/OT athletes and their NORM peers who trained >2 $h \cdot d^{-1}$ (NFOR/OT = 23% vs NORM = 17%) and 6–7 $d \cdot wk^{-1}$ (NFOR/OT = 24% vs NORM = 18%). However, the incidence of NFOR/OT was significantly greater in individual sports compared with team sports (37% vs 17%, $P < 0.01$) and higher in low–physical demand sports compared with high-demand sports (34% vs 25%, $P < 0.01$; Table 1). The number of individual-sport athletes training >2 $h \cdot d^{-1}$ ($P < 0.01$) and 6–7 $d \cdot wk^{-1}$ ($P < 0.05$) was significantly higher compared with that of team-sport athletes. A significantly greater number of NFOR/OT athletes and of individual-sport athletes reported doing <5 h of activities outside their sport each week compared with the NORM and team-sport athletes, respectively ($P < 0.05$).

Gender Differences, Age, and Years in Sport

The incidence of NFOR/OT was significantly greater in females (36%) compared with males (26%, $P < 0.05$), yet there was no greater participation by females in individual sports (47% females vs 52% males, $P > 0.05$). No sex differences were also found between athletes practicing individual sports at the national level and athletes practicing individual sports at the international level. The NFOR/OT group was slightly older than the NORM athletes (15.3 ± 1.9 vs 14.9 ± 2.0 yr, $P < 0.05$), but there were no significant differences in the years of training/competing in sport (3.9 ± 1.5 vs 3.7 ± 1.4 yr, $P = 0.42$).

Competitive Level

There was a greater incidence of NFOR/OT at the higher representative levels ($P < 0.01$), with national and international athletes showing higher rates of prevalence in comparison with club, county, or regional athletes (Fig. 1).

Incidence of NFOR/OT at the Time of Answering the Survey

Twelve percent of the NFOR/OT athletes indicated that they were experiencing this at the time of answering the survey. Comparing the responses of these athletes with those who reported historical episodes of NFOR/OT showed no significant differences in any variable, except one item, "not being motivated to train/compete at the time," which was greater in the current NFOR/OT athletes ($P = 0.02$).

Duration of episode. The majority of NFOR/OT athletes reported just one episode, with the most common duration being <1 month; the athletes had, on average, experienced NFOR/OT on two occasions (SD = 2), with an average duration of 4 wk (SD = 4). Sixty-two percent of the NFOR/OT athletes reported a decreased motivation to continue training during the NFOR/OT episode ($P = 0.001$); these athletes also reported a higher number of episodes compared with the athletes who kept their motivation. The duration of the NFOR/OT episode lasted longer in athletes who had decreased motivation to train.

Symptomatology/Psychosocial Issues Reported by the NFOR/OT Athletes

The seven most frequently reported physically and psychologically related symptoms are presented in Figures 2 and 3.

A significantly higher percentage of the NFOR/OT athletes compared with the NORM athletes reported feeling bad when they did not perform according to their parents'

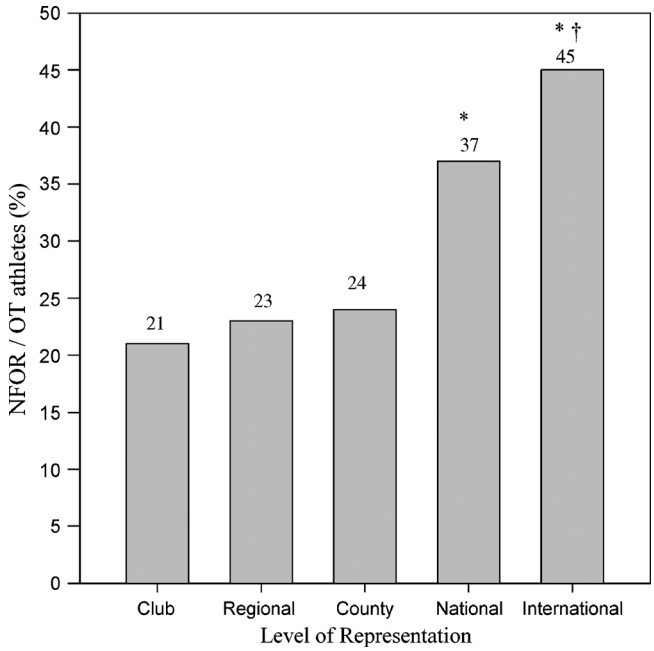

FIGURE 1—Incidence of NFOR/OT across all competitive levels ($N = 376$). *Significant differences between the national level and the lower levels ($P < 0.05$). †Significant differences between the national and international levels ($P < 0.05$).

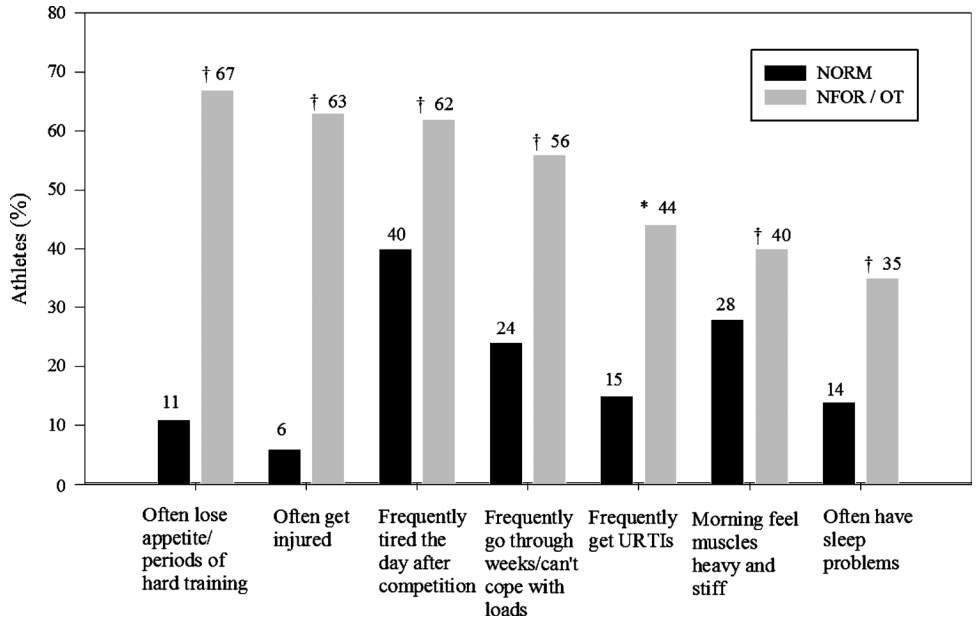

FIGURE 2—Seven most reported physical symptoms between the NORM and NFOR/OT groups. *Significant difference between groups ($P < 0.05$). †Significant difference between groups ($P < 0.01$).

expectations ($P = 0.03$). Further, a greater percentage of NFOR/OT athletes reported that their sport was the most important thing in life (20% vs 10% NORM) and spending <5 $h \cdot wk^{-1}$ in other activities and hobbies away from their sport ($P < 0.05$). These children described a lack of being able to cope with balancing schoolwork with training commitments and that they were struggling to cope with the tiredness derived from training (Fig. 4). The two significant predictors of NFOR/OT in these young athletes were competitive level and gender ($P < 0.05$). However, the overall explained variance was small for both gender and competitive level at 1.7% and 4.7%, respectively (Table 2).

DISCUSSION

Incidence rates. The purpose of this study was to determine the nature and prevalence of NFOR/OT in young English athletes. The main finding is that almost a third of

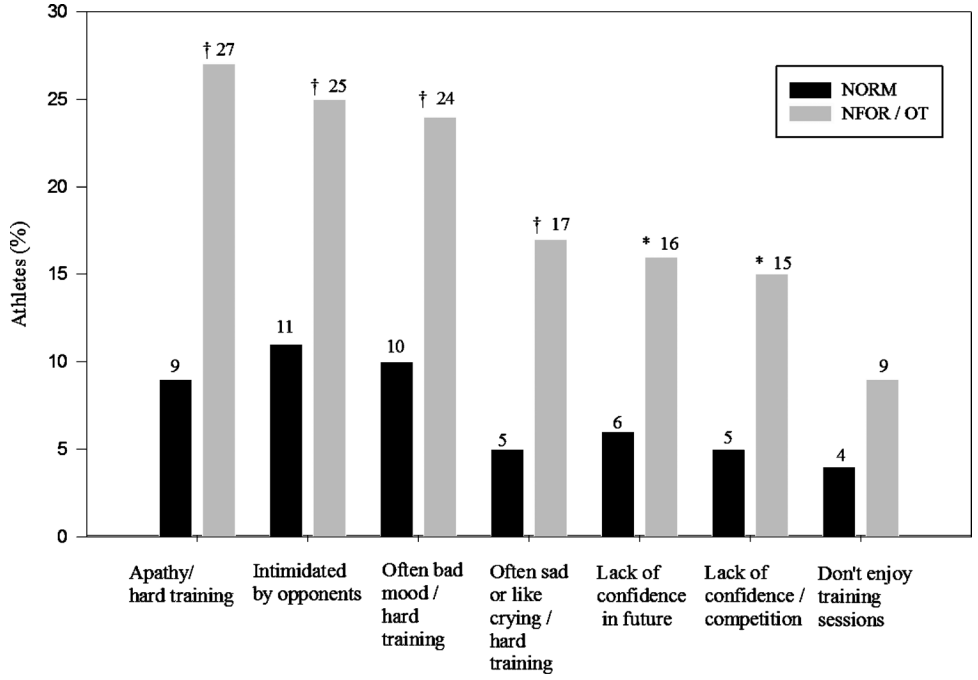

FIGURE 3—Seven most reported psychological symptoms between the NORM and NFOR/OT groups. *Significant difference between groups ($P < 0.05$). †Significant difference between groups ($P < 0.01$).

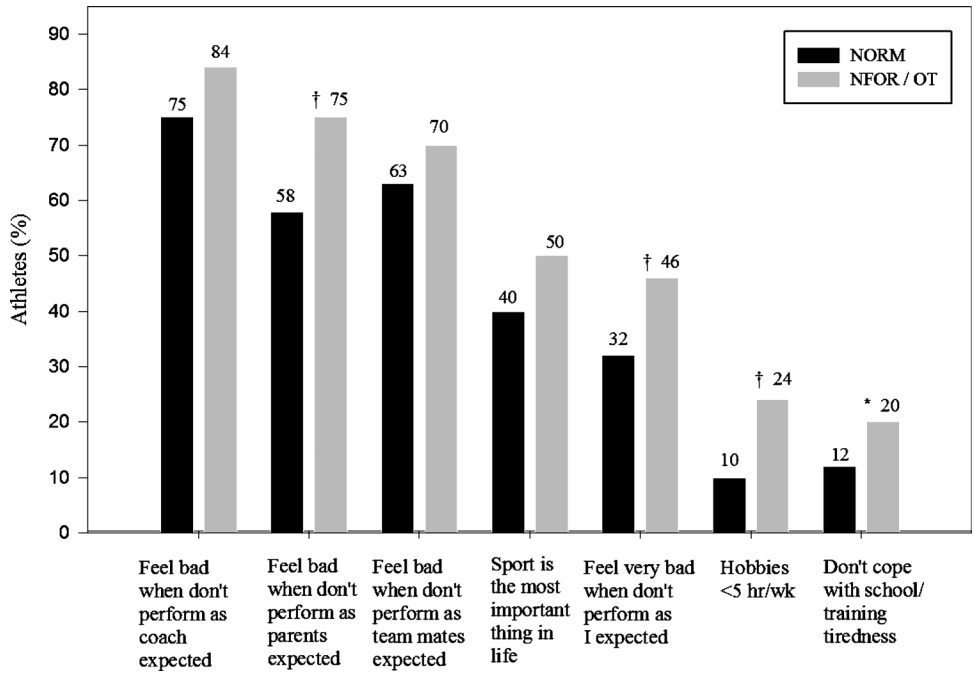

FIGURE 4—Seven most reported psychosocial issues between the NORM and NFOR/OT groups. *Significant difference between groups ($P < 0.05$). †Significant difference between groups ($P < 0.01$).

young athletes (29%) have experienced NFOR/OT at least once during their sporting life. These data agree with two other surveys of older adolescent athletes (age = 15–21 yr) who reported similar incidence rates of 35% and 37%, respectively (19,35). Our data also compare closely to the results of Morgan et al. (30), who found a 33% incidence of OT for nonelite adult women distance runners. The convergent validity of these new study data gives support to the notion that retrospective survey data acquired from young people are indeed valid sources of information.

The rate of NFOR/OT was higher in individual sports (37%) compared with team sports (17%); this finding is similar to that reported by Kenttä et al. (19) in youth athletes—48% individual sports versus 30% team sports. It is argued that OT is more common in individual sports because of the higher daily training hours, resulting in greater time and physical demands on the athlete (5,19). The results from this survey support this idea, with NFOR/OT individual athletes engaging in >2 h of training per day and 6–7 d of practice per week, which was significantly more than that reported by the NFOR/OT team-sport–playing athletes. Clearly, training load may play a greater role in the development of NFOR/OT for individual-sport athletes compared with team-sport athletes; Morgan et al. (30) also found that OT incidence was higher in elite female runners compared with nonelite athletes, the latter performing lower training loads.

TABLE 2. Significant predictive variables for NFOR/OT.

	Change −2 Log Likelihood	*P*	Nagelkerke R^2
Step 5			
Gender	4.4	0.035	0.017
Competitive level	12.9	0.000	0.047

The log likelihood value refers to the amount of contribution the variable exerts on the model; the Nagelkerke R^2 (Nagelkerke R square) is the explained variance given by each variable to NFOR/OT.

Training load alone, however, may not be the sole reason behind the greater incidence rate observed in individual-sport athletes, with the data showing that individual-sport athletes are more occupied with their sport and dedicate less time to other school or social activities. The amount of individual-sport athletes who spend <5 $h \cdot wk^{-1}$ in other activities apart from their sport was significantly higher compared with team-sport athletes ($P \leq 0.05$). These athletes complained of being unable to recover fully from previous training loads or after competition and of not coping well with schoolwork and training demands; similar results have also been found in the surveys of Kenttä et al. (19) and Raglin et al. (35). Our findings support the notion that they are at risk of developing a unidimensional identity, something identified as a potential risk factor in the development of OT (4,17,19). Identities are claimed and constructed through social relationships experienced throughout life (4); therefore, if sport/training provides the sole opportunity for social interaction, it is unsurprising that the young athlete may develop a single identity. Self-esteem, identity, and self-worth become intertwined and become dependent on sporting success, which is fine when success is forthcoming but can lead to stress and anxiety when failure/injury is present, possibly contributing to the development of NFOR/OT (4). When an athlete focuses all his/her efforts into his/her sport, he/she can become defined by it. The development of self-complexity and multiple identities has been shown to provide a cushion or outlet for the stress related to training and seemed to dampen the swings in self-belief/doubt arising from their sport

performance—resulting in a more balanced and better coping young athlete (4). As such, those working with elite young athletes should help provide the opportunities and time for the development of a multidimensional identity in the athletes in their care and encourage them to have a range of hobbies/interests alongside their sport.

A significantly higher incidence of NFOR/OT was found in low–physical demand sports (34%), suggesting that alternative factors can influence the development of NFOR/OT in some young athletes (4,16,20,32). Also, no significant differences were reported between the NORM and NFOR/OT groups in relation to the amount of training load currently undertaken. Two child-based studies have reported OT in young golfers (5,19), and it has been suggested that NFOR/OT may be present in athletes playing sports that involve low intensities, i.e., golf or cricket, because of factors such as training time commitments, multiple back-to-back competitions, travel schedules, and, at the elite level, pressure for financial rewards, professional contracts, or sponsorship deals; all combine to provide a combination of associated stressors that, if badly managed, may result in an NFOR/OT state (19,36). The finding that training load is not always the main or sole factor for the development of NFOR/OT in children is important, and these data add to the evidence that reveal that NFOR/OT can occur at high rates even in athletes who are not exposed to high training loads (12,16,19,26,35).

A greater percentage of girls (36%) were NFOR/OT compared with boys (26%), a finding that contradicts the results in adults (16) but mirrors that reported previously in other young athlete studies—30%–35% (19,35). Although it has been suggested that the sporting female has to cope with conflicts related to the feminine cultural role ideals that may lead to identity confusion (28), further work is required to confirm these findings and uncover the unique sources of stress experienced by the sporting female that may lead to NFOR/OT.

An advantage of our study was that it sampled children from different competitive levels rather than just the elite youth athlete. The results showed that the incidence rate of NFOR/OT was increased in national and international athletes but that a significant minority of subnational child athletes also had experienced NFOR/OT. The incidence rate reported in our national- and international-level athletes (37% and 45% incidence, respectively) agree with those reported for elite child athletes by Raglin et al. (35) (37%), Kenttä et al. (19) (35%), and Kenttä and Hassmén (17) (47%). Our data therefore provide new evidence that OT is an issue not just seen in elite athletes because approximately 20% of children who play at local to regional levels may also experience the condition at some point in their careers.

At the elite level, athletes are expected to train more (19) in addition to the quest for prizes, sponsors' contracts, media attention, and the extra traveling for different competitions (36), most of which are not evident at the lower competitive levels; thus, the elite child athlete faces a range of extra external pressures that may underlie the greater incidence in OT. However, children playing sport at the lower representative standards are also reporting external pressure from schoolwork, relationship stresses, and pressure from parents and/or coaches, which, in the individual child, may conspire to bring about an NFOR/OT state. This underlines that NFOR/OT is as much an issue for the schoolteacher or the local club coach to consider as for those involved with high-level young performers, something that is often overlooked in the education and advice that adults receive before their involvement.

Motivational issues with the NFOR/OT athletes. An important finding from the present study was that there were no differences in the issues that were reported by the athletes who were remembering retrospective episodes of NFOR/OT with those who were in this state at the time of completing the survey. The latter findings suggest that the athletes' ability to recall important past events is not affected and consequently reinforces the confidence in the findings. However, one issue where they did differ was in regard to the loss of motivation to train and compete. The current NFOR/OT athlete reported a reduced motivation to continue compared with the retrospective reports. The latter is understandable because 62% of NFOR/OT athletes reported a loss of motivation to continue training/competing during the NFOR/OT episode. This indicates that the motivation to continue training during an OT period is an essential factor to differentiate between the seriousness of the episode because the loss of motivation is thought to be a crucial factor in the development of burnout and in the consequent dropout from sport (8,12). It is important to recognize that the loss of motivation in overtrained athletes may not be sufficient to lead them to withdraw from their sport; i.e., athletes in an OT state often have motivation to keep training (19), whereas athletes experiencing burnout are on the verge of losing or have lost the motivation to continue training (8,33). Kenttä et al. (19) suggested that the number of bouts of OT is an important predictor of quitting sport (19). OT and burnout seem to develop as an accumulation of discreet episodes that tend to worsen until the athlete eventually decides to drop out from the sport. The young athletes who reported a loss of motivation during NFOR/OT had a higher number of episodes that had lasted longer compared with the athletes whose motivation continued. The loss of motivation is thought to arise because athletes feel mentally and physically exhausted and moody with low confidence. Athletes who feel they are not contributing to the team/club feel undervalued and isolated, resulting in a lack of control over their lives (4).

Physical symptoms. Many of the symptoms described by Raglin et al. (35) and Kenttä et al. (19) were present in young English athletes: frequent losses of appetite during periods of hard training and/or competition, increase in perceived training effort, feelings of muscle heaviness, and frequent sleep problems; the same symptoms have also been reported elsewhere (6,15,16,36). Interestingly, the symptoms

reported by the young athletes with NFOR/OT were similar to those seen in adults: frequent occurrence of injuries, feeling tired the day after competing, and high occurrence of upper respiratory tract infections (2,6,7,13,18,23,24,32,33,38). Athletes with NFOR/OT are thought to have a depressed immune function secondary to the chronic physical and mental stress (2,37), resulting in a concomitant disturbed neuroendocrine function (2,23,25,32) that is reflected by the symptomatology previously described (7,30).

Psychological symptoms. The NFOR/OT athletes reported specific psychological symptoms during their episodes that may be useful markers of the overtrained state: feeling apathetic during periods of hard training, often in bad moods, and feeling sad or like crying during periods of hard training. The surveys by Raglin et al. (35) and Kenttä et al. (19) also found that overtrained athletes exhibited greater mood disturbances compared with healthy individuals. Adult research has shown that mood disturbances are increased during periods of intensified training and tend to be greater in OT athletes (29,30,34). Furthermore, the NFOR/OT athletes complained of feeling intimidated by their opponents in competition, with a lack of confidence in their future as athletes and in competitions and showing reduced enjoyment for training sessions. It is known that excessive signs of anxiety and emotional stress are symptoms associated with mood changes and with the development of OT (21); thus, a similar etiology seems to be evident in young athletes.

Psychosocial factors. Psychosocial factors were also associated with NFOR/OT in young athletes. The findings show that athletes are putting a lot of pressure on themselves to meet or exceed their parents' or their own expectations, which increases the risk of OT (2,23,36,38). When expectations are high, not achieving these can make the athletes feel guilty, which in turn can act as a stress factor exacerbating the situation (9).

The NFOR/OT athletes reported that their sport was the most important thing in their life and that the amount of time that these individuals are dedicating to other activities outside their sport is very limited, suggesting the development of a unidimensional identity (4). Comparable results were found in Swedish competitive athletes where the incidence of burnout was strongly linked to the development of a unidimensional identity (17). Kenttä et al. (19) found that 20% of overtrained athletes devoted <5 h·wk^{-1} to activities outside of their sport and around 40% who did nothing else but their sport. The negative consequences of concentrating on sport too intensely, especially at a young age, translate into the development of a unidimensional identity that does not allow a buffering of the negative effects of stressful events (4). Also, the NFOR/OT group reported a lack of ability to cope between the demands from school and/or work and the tiredness derived from training, which has previously been reported as a contributing factor to the development of OT (2,23,36). Because the majority of young athletes are involved in compulsory education, the physical and time demands of their training schedule may negatively affect their school-based work. We suggest that the young athletes be supported in developing time management skills to help them control the competing demands of their lives and that their teachers/coaches/parents support them in this. In contrast, Coakley's (5) view is that the problem is not a personal failure of an individual's coping strategies but is embedded in the structures of competitive sport. Coakley (5) entitled it *psychodoping*, whereby the young athlete is made dependent on others and is discouraged from asking critical questions about his/her involvement in sport. Ensuring that young athletes are involved in the decision-making processes affecting their lives, on both a micro and macro scale, is important, and opportunities for this dialogue to occur should be given.

A potential limitation to this study is that it is a self-administered survey, a subjective measure that is prone to participant bias and poor memory recall. However, these types of research instruments not only are common in medical research but also can yield important information so as long as questions are clear and respondents have the resources to answer (11), which we assessed through a pilot study. There was no evidence of poor memory recall because of the similarity in responses between the current and historical NFOR/OT athletes' responses. Finally, the results of this survey mirror that of previously published works (19,35), giving confidence to the validity of the findings.

In conclusion, this study assessed the current state of NFOR/OT in young English athletes. By using a method that examined athletes' physical, psychological, and cultural issues, a more complete and broader understanding of the problem was achieved. Approximately 29% of young English athletes had experienced NFOR/OT in their past, with elite performers and those in individual sports most at risk. The symptomatology of NFOR/OT in children reflects closely that seen in adults but varies widely between individuals. Importantly, both training and nontraining stressors are reported as significant elements in the profile of the NFOR/OT child, and this is not just an issue of excessive training load. NFOR and OT are a serious issue for young athletes, and coaches, parents, medics, and athletes are advised to view the problem as multifactorial and multidimensional. This deeper understanding is essential to develop new and effective strategies to protect athletes from experiencing the negative consequences of NFOR/OT during their sporting careers.

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There is no conflict of interest.

Results of the present study do not constitute endorsement by the American College of Sports Medicine.

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