

OBSESSIVE-COMPULSIVE AND DEPRESSIVE SYMPTOMS
IN PROFESSIONAL TENNIS PLAYERS

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Abstract

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Objective: A moderate sport activity is considered beneficial for both physical and mental health. On the contrary, different studies have shown that professional players may be more vulnerable to suffer from psychological and/or psychiatric disorders. Given the limited information available, the present study aimed to investigate the possible presence of depressive and obsessive-compulsive symptoms or disorders in a group of professional tennis players.

Method: Twenty-five current or former professional tennis players (18 men and 7 women; mean age \pm SD: 42.32 \pm 13.45 years), were recruited within the Italian Tennis Federation during an international competition and during a master meeting of coaches. They were compared with a control group, recruited from university students, doctors and nurses. All of them underwent a psychiatric interview with a structured scale and a psychopathological assessment carried out with the Mini-International Neuropsychiatric Interview (MINI), the Yale-Brown Obsessive Compulsive Scale (Y-BOCS) and the Self Assessment Scale for Depression (SAD).

Results: The Y-BOCS total and subscale scores were significantly higher in both current and past athletes than controls. Current athletes showed higher scores at Y-BOCS total, subscales and some items. The majority of the current athletes also showed superstitions and magical thinking.

Conclusions: The present study demonstrated that professional tennis players show a relevant increase of obsessive-compulsive symptoms and superstitions than controls. Interestingly, current athletes resulted more severe than past ones. Taken together, our findings support the notion that agonistic sport activities of high level require intensive training and compliance to strict daily routines that might represent a sort of vulnerability toward the onset of full-blown obsessive-compulsive disorder (as well as other disorders) in more fragile individuals. Not surprisingly, sport psychological support experts are increasingly needed.

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Introduction

Sport activity plays an essential role in daily routine, as it represents both an integrating social leisure and a fundamental aspect of physical and mental health (Kvam et al., 2016; Yazici et al., 2016; Lee et al., 2020; Parra et al., 2020). Public health suggests practicing regular sport activity in order to possibly prevent heart diseases, hypertension, diabetes mellitus and obesity (González-Gross & Meléndez, 2015). Sport is also able to reduce stress, anxiety, and to positively regulate mood (Briazgounov, 1988; Hardoy et al., 2011; Kvam et al., 2016; Yazici et al., 2016; Mikkelsen et al., 2017; Lee et al., 2020). Indeed, neurobiological researches

demonstrate that a moderate physical activity might induce a sort of antidepressant effect by increasing neurogenesis, cognitive flexibility and neuronal plasticity, especially in the hippocampus (Jeoung, 2014; Ishihara & Mizuno, 2018; Micheli et al., 2018), or by increasing mitochondrial activity and eliciting anti-oxidative and anti-aging effects (Brand et al., 2020).

Agonist athletes undergo a major physical and mental stress with a constant focusing on their exhausting training schedules, and upholding concentration, motivation and endurance to overcome their individual limits and records, or to attain established rankings. In addition, injuries, performance expectations, losing games and involuntary career stopping or ending might

all represent stressful events with a bad impact on future performances, on athlete's self-confidence and, as such, they may be considered predictors of psychopathology (Wughalter & Gondola, 1991; Baillie & Danish, 1992; Brewer, 1993; Sinclair & Orlick, 1993; Stambulova, 1994; Taylor & Ogilvie, 1994; Stambulova, 1995; Alfermann et al., 2004; Erpic et al., 2004; Wippert & Wippert, 2008; Appaneal et al., 2009; Armstrong & Oomen-Early, 2009; Wippert & Wippert, 2010; Hammond et al., 2013; Stillman et al., 2016; Aben et al., 2018; Sverdlik et al., 2019; Nicholls et al., 2020). Different studies indicate that professional athletes may become more vulnerable to suffer from psychological issues and psychiatric disorders, particularly depression, anxiety substance abuse and addictive disorders (Wughalter & Gondola, 1991; Brewer, 1993; Brewer & Petrie 1995; Yang et al., 2007; Appaneal et al., 2009; Armstrong & Oomen-Early, 2009; Hammond et al., 2013; Weigand et al., 2013; Jeoung, 2014; Wolanin et al., 2015; Rice et al., 2016; Stillman et al., 2016; Caccese et al., 2020; Johnston et al., 2020; Nicholls et al., 2020). By contrast, other few studies reported agonist activity as a protective factor counteracting mood, anxiety and sleep disorders.

Unfortunately, in our modern society, the professional athletes are individual considered to be mentally ready to deal with any adversities that they may encounter in their career, without showing any sign of weakness, with the risk that some may deny their mental disorders or hide them for the fear of potential consequences on their professional path (Gulliver et al., 2012). For these reasons, in the last decades, psychological support for athletes has grown during both competitions and preliminary times, while aiming to offer helpful support to prevent the stress (Watson, 2006; Stillman et al., 2016; Reardon et al., 2010).

Interestingly, some individual psycho(patho)logical characteristics seem functional to agonistic, compared to non-agonistic activities. According to available data, these features include obsessional and superstitious/magical thinking, rituals/compulsions, as well as inflexibility in routine activities focused towards reaching the stereotype of perfection (Gucciardi et al., 2015; Dömötör et al., 2016; Lichtenstein et al., 2017; Schiphof-Godart & Hettinga, 2017; Nogueira et al., 2018; Sicilia et al., 2018). These characteristics seem to be more relevant in agonistic than in non-agonistic activity (Ahn et al., 2020).

Tennis players are some of the utmost stressed athletes. They are obliged to cope alone and for a long time with a great psychological pressure related to performance expectations, the possibility to lose games and involuntary career discontinuation, as well as to encounter risk of repetitive traumas and injuries (Grove et al., 1997; Schiphof-Godart & Hettinga, 2017). Furthermore, although tennis career has a variable length, athletes have a short amount of time to optimize the period at their disposal, with regards to their physical prowess (Murphy, 1995). It is conceivable that all these factors may create a vicious cycle that is nourished by its daily repetition while affecting every life aspect. In addition, as already mentioned, they might represent a sort of vulnerable basis towards the possible onset of full-blown psychopathological disorders.

Given the paucity of information, the aim of this study was to investigate the possible presence of depressive and/or obsessive-compulsive symptoms or disorders, as well as of superstitions or magical thinking, in a group of professional tennis players, by means of standardized assessment scales, as compared with healthy subjects who did not professionally perform any kind of sport activities.

Methods

Twenty-five professional tennis players (18 men and 7 women; mean age \pm SD: 42.32 \pm 13.45 years) were included in this study, of whom 13 (10 men and 3 women; mean age \pm SD: 35.86 \pm 13.89) were in current activity and 12 were former players (8 men and 4 women; mean age \pm SD: 51.67 \pm 10.18). The athletes were recruited within Italian Tennis Federation during Fed Cup Competition in Tallinn (Estonia, Feb. 4-8, 2020), and during a master meeting of coaches and player at "Centro di Preparazione Olimpica" in Tirrenia (Pisa, Italy, Feb. 18, 2020). The athletes were compared with a similar group of healthy subjects (13 men and 12 women; mean age \pm SD: 33.76 \pm 11.87), performing professionally no kind of sport, recruited amongst university students, medical residents and nurses. They had no medical disorder, as assessed by their regular laboratory tests and medical check-up, were not smokers, and did not take psychotropic drugs, except occasionally hypno-inducers to counteract jet-lag in eight cases. All subjects underwent a psychiatric visit and structured interview to assess the presence or absence of axis I or II disorders, in a relaxing room at constant temperature, one day before and after the game. The psychopathological assessment was carried out with the following rating scales: the Mini-International Neuropsychiatric Interview (M.I.N.I.) (Sheehan et al., 1994), the Self-Assessment Scale for Depression (SAD) (Cassano & Castrogiovanni, 1982), and the Yale-Brown Obsessive Compulsive Scale (Y-BOCS) (Goodman et al., 1989).

Psychopathological assessment

Mini-International Neuropsychiatric Interview (M.I.N.I.)

The M.I.N.I. is a screening tool used for exploring major psychiatric symptoms and diagnosing several psychiatric disorders according to the Diagnostic and Statistical Manual of Mental Disorders fourth edition (DSM-IV) or International Classification of Diseases tenth edition (ICD-10). It is structured as a short clinical interview that takes about 15 minutes and is characterized by its simplicity and ease of use. It was developed by the Sheehan's (USA) and Lecrubier's (France) groups (Sheehan et al., 1994) and was then translated into more than 35 languages. M.I.N.I. is divided into modules, all of which include one or two preliminary screening questions, followed by questions aimed at detecting specific symptoms and then by the assessment of impaired functioning and concomitant pathologies or substance abuse (Sheehan et al., 1994).

The Yale-Brown Obsessive-compulsive rating scale (Y-BOCS)

The Y-BOCS is worldwide regarded as a primary tool to assess OC symptoms severity and treatment response. The scale is made up of 16 items, the first 10 of which are the basic ones and their sum is considered as the total score of the test. These items concern five obsessions and five compulsions that investigate the time consuming, the interference, the suffering, the resistance and the control of patients. The other 6 items explore the insight capacity, the avoidance, the pathological character of the slowdown, of the responsibility and of the doubt. The scale is also associated with a checklist which illustrates 70 different

obsessions and compulsions and that serves to identify the symptoms whose severity is assessed. The 16 items are evaluated on a 5-point scale (0-4 with 0 = absence of the symptom and 4 = maximum severity).

Self-Assessment Scale for Depression (SAD)

The SAD was developed at the Psychiatry Institute of the University of Pisa in the late 70s and early 80s, in order to offer the clinician and the researcher a reliable self-assessment tool for depressive symptoms and anxiety that frequently accompanies it (Cassano & Castrogiovanni, 1982). The reference period is represented by the immediately preceding days and the moment of the evaluation. The scale is made up of 31 items assessed on a 4-level scale: from 1 (absence of the symptom) to 4 (maximum severity). For all the items, the scale has an increasing trend of gravity, except for item 29 "I would be fine only in bed (during the day)" for which the answer is yes/no and the scores are respectively 4 and 1. In our research, we considered each item score and the total score given by the sum of the single scores (Conti, 1999).

Statistical analyses

Data were analyzed and compared by age, gender and sport activity. Moreover, statistical analysis was performed by means of contingency tables, χ^2 tests, group statistics, paired, independent and Mann Whitney's tests.

Results

The sex and age composition of the groups resulted similar, while the mean age was significantly higher in the athletes' group than the control group ($t = 2.3$, $p = 0.029$). The athletes that currently were performing agonistic activity had a statistically significant lower age compared to those who had left high level competitions ($t = 4.465$, $p < 0.001$).

Psychopathological features

Athlete had no past or current Axis I or II disorders, according to DSM-5 criteria, as assessed by the clinical interview and the M.I.N.I., except one woman, out of the total 13 who were active, who had been suffering from anorexia during adolescence. Some athlete (12) showed some obsessive (8) and anxious (4) personality traits.

Yale-Brown Obsessive-compulsive rating scale (Y-BOCS)

The most common obsessions in athletes were: miscellaneous (13 currently and 8 lifetime), aggressive (10 currently and 9 lifetime), contamination (8 currently and 4 lifetime), somatic (8 currently and 4 lifetime), religious (3 currently and 4 lifetime) sexual (2 currently and 2 lifetime), hoarding/saving (2 currently and 1 lifetime), and symmetry/exactness (3 lifetime). The most compulsions and rituals athletes described were: miscellaneous (8 currently and 5 lifetime), checking (8 currently and 2 lifetime), ordering/arranging (5 currently), hoarding/collecting (2 currently and 2 lifetime), cleaning/washing compulsions (1 currently and 1 lifetime), and counting (2 currently) (**table 1**).

The most common obsessions of control subjects were: aggressive (8 currently and 11 lifetime), miscellaneous (9 currently and 7 lifetime), contamination (3 currently and 3 lifetime), somatic (3 currently and 2 lifetime), symmetry/exactness (2 currently and 3 lifetime), hoarding/saving (2 currently and 2 lifetime), and religious (1 lifetime). Nobody reported sexual obsessions. The most common compulsions were: miscellaneous (1 currently and 8 lifetime), checking (4 currently and 1 lifetime), ordering/arranging (2 currently and 1 lifetime), repeating (2 lifetime), and cleaning/washing compulsions (1 currently and 1 lifetime) (**table 2**).

The Y-BOCS total score was significantly higher in both current and retired athletes than control subjects (5.96 ± 5.76 versus 1.24 ± 2.65 , $p = 0.001$, $t = 3.72$). Moreover, the "obsessions" and "compulsions" subscale total scores were significantly higher in athletes than in controls: respectively, 3.24 ± 3.05 vs 0.96 ± 1.93 ($p = 0.003$, $t = 3.16$), and 2.72 ± 2.95 vs 0.28 ± 0.89 ($p = 0.001$, $t = 3.96$). Athletes showed significantly higher scores than controls of the following items: "Insight" ($p = 0.005$, $t = 2.91$), "Avoidance" ($p = 0.014$, $t = 2.55$), "Degree of indecision" ($p = 0.002$, $t = 3.33$), "Overvalued sense of responsibility" ($p = 0.003$, $t = 3.13$), "Pervasive slowness" ($p = 0.014$, $t = 2.56$), "Pathological doubting" ($p = 0.001$, $t = 4.66$).

Current athletes more frequently showed current aggressive obsessions ($\chi^2 = 0.041$, $r = 5.24$) and current miscellaneous compulsions ($\chi^2 = 0.030$, $r = 5.94$) than past athletes: the Y-BOCS ($t = 3.4$, $p = 0.002$) obsessions ($t = 3.48$, $p = 0.002$), and compulsions subscale ($t = 3.11$, $p = 0.005$) scores were higher in current than in retired tennis players (**table 1**). They also showed higher scores of the following Y-BOCS items: "Interference of obsessions" ($t = 2.41$, $p = 0.025$), "Distress of obsessions" ($t = 2.47$, $p = 0.021$), "Resistance to obsessions" ($t = 2.41$, $p = 0.024$), "Interference of compulsions" ($t = 2.89$, $p = 0.008$), "Distress of compulsions" ($t = 3.68$, $p = 0.001$) "Insight" ($t = 2.10$, $p = 0.047$), "Degree of indecisiveness" ($t = 2.65$, $p = 0.014$).

Self-Assessment Scale for Depression (SAD)

The analysis of the SAD questionnaire did not reveal any significant intergroup differences (**table 2**). In the whole athletes' group, women presented a statistically significantly higher score of the item 18 - "Less interested in work and hobbies" - ($t = 2.57$, $p = 0.017$). On the other hand, current athletes showed significantly higher scores in the items 3 - "Need of crying" - ($t = 2.22$, $p = 0.037$) and 16 - "I feel uncertain and indecisive" - ($t = 2.71$, $p = 0.013$) than inactive athletes.

Women of the control group reported significantly higher scores of items 5 - "Less interested in eating" - ($t = 2.45$, $p = 0.023$) and 9 "Throbbing" ($t = 2.01$, $p = 0.049$) than men.

The gender analysis showed that men of both athlete groups has significantly higher scores than women or men of the following items: "Resistance to obsessions" ($p = 0.032$, $t = 2.28$), "Interference of compulsions" ($t = 2.13$, $p = 0.045$) and "Resistance to compulsions" ($t = 2.27$, $p = 0.033$). On the contrary, no gender-related differences were noted in the control group. However, these findings should be interpreted with caution given the small number of women in the group (**table 3**).

The majority (23) of our athletes had superstitious rituals and magical thinking. Ordering and symmetry obsessions and/or related rituals were present in five

Table 1. Distribution of obsession and compulsive subtypes in 25 tennis players and controls

| | Tennis players Currently/Lifetime | Controls Currently/ Lifetime |
|-----------------------|--------------------------------------|---------------------------------|
| Aggressive | 10/9 | 8/11 |
| Symmetry/exactness | 0/3 | 2/3 |
| Hoarding/saving | 2/1 | 2/2 |
| Somatic | 8/4 | 3/2 |
| Contamination | 8/4 | 3/3 |
| Religious | 3/4 | 0/1 |
| Sexual thoughts/image | 2/2 | 0 |
| Miscellaneous | 13/8 | 7/9 |
| Checking rituals | 8/2 | 4/1 |
| Repeating | 0/0 | 0/2 |
| Cleaning/washing | 1/1 | 1/1 |
| Ordering/arranging | 2/0 | 2/1 |
| Rituals of counting | 2/0 | 0 |
| Hoarding/collecting | 2/2 | 0 |
| Other types | 8/5 | 1/8 |

Table 2. Yale-Brown Obsessive-Compulsive Scale (Y-BOCS) total and subscale scores (mean ± SD) in 25 tennis players and 25 controls

| | Tennis players | Controls | t | p value |
|--------------------------|----------------|-------------|------|---------|
| Y-BOCS total score | 5.96 ± 5.76 | 1.24 ± 2.65 | 3.72 | 0.001 |
| Obsession subscale score | 3.24 ± 3.05 | 0.96 ± 1.93 | 3.16 | 0.003 |
| Compulsion subscale | 2.72 ± 2.95 | 0.28 ± 0.89 | 3.96 | 0.001 |

Table 3. Yale-Brown Obsessive-Compulsive Scale (Y-BOCS) total and subscale scores (mean ± SD) in current and retired tennis players

| | On course | Retired | t | p value |
|--------------------------|-------------|-------------|------|---------|
| Y-BOCS total score | 8.93 ± 5.44 | 2.50 ± 3.10 | 3.49 | 0.002 |
| Obsession subscale score | 4.92 ± 2.73 | 1.42 ± 2.02 | 3.48 | 0.002 |
| Compulsion subscale | 4.29 ± 2.86 | 1.08 ± 1.66 | 3.11 | 0.005 |

current athletes, specifically organizing of cloth and personal tools in the tournament accommodations, especially in the bathroom, bedside or tables following a precise order and symmetry. Ten athletes took great care of their objects with control rituals, especially two current tennis players carefully clean and pack rackets due to fear of contamination. Five athletes used rituals of repetition, mainly associated with counting rituals, with a prevalence in current and male tennis players. The choice of colours of clothes resulted to be important for all current professional athletes. During the matches, all players used to move the towels on the sidelines, ritualized movements such as adjusting shirts or shorts according to a precise order and symmetry, organizing the bench and arranging with needed tools neatly, and count rituals as for the ball rebound before service. Six men in current activity used to pray before

the game, three listened to music to focus on matches or have magical thoughts; three athletes used to carry lucky charms or specific socks in the most important matches or to eat same plates during tournament lunches or dinners.

Mild superstitious behaviours were also present in seven controls.

Discussion

The present study was carried out in a group of current and past tennis players of both sexes in order to explore the possible presence of obsessive-compulsive and depressive symptoms and/or disorders, as assessed by a psychiatric interview and rated by the MINI, Y-BOCS and SAD rating scales.

Our findings showed that 24, out of the 25 tennis

players had no past or current history of major psychopathology or personality disorders. Only one woman had been suffering from anorexia nervosa during adolescence. However, tennis athletes showed higher Y-BOCS total, obsessions and compulsions subscales scores than the control group. No intergroup difference was noted in the frequency of obsessions and compulsions between athletes and controls, but ordering was the most frequent compulsion in women of the athletes groups. Regarding the differences between current and past athletes, the first showed higher somatic, aggressive and miscellaneous obsessions than the second. Furthermore, a greater severity was noted in the following items. "Interference and distress of obsessions", "Resistance to compulsions", "Insight" and "Avoidance". Taken together, these findings would indicate that an ongoing career might influence the severity of OC symptoms, given the high pressure and level of stress due to competitions athletes have to face.

Our study showed that the majority of our athletes had superstitious rituals and magical thinking that they considered normal and useful especially before the competitions.

To the best of our knowledge, this is the first study reporting evidence of obsessive-compulsive traits and symptoms, as well as superstitions and magical thinkings amongst tennis players. Indeed most of the available findings on this topic have been gathered in other sport disciplines. Previously, professional athletes have been demonstrated to show a higher prevalence of obsessive-compulsive traits than healthy subjects. Indeed, it is generally believed that superstitious and magic thoughts, obsessions, rituals or compulsions and inflexibility might exert an adaptive role and be functional to their routine activities (Gucciardi et al., 2015; Dömötör et al., 2016; Lichtenstein et al., 2017; Schiphof-Godart & Hettinga, 2017; Nogueira et al., 2018; Sicilia et al., 2018). Superstitions may be viewed as positive as they have been related to a greater persistence during tasks, to a higher confidence to face performances and to an increased self-esteem (Damisch et al., 2010; Li, 2010; Stenseng & Dalskau, 2010). On the other hand, superstitious and magical thinking may affect the athlete's daily life, since a stereotype of perfection may be pursued, with a poor fault tolerance and the quest for rewarding superior performances (Nordin-Bates et al., 2014). According to some scholars, perfectionism in sport has both adaptive and maladaptive features, since it may be related to success achievement on the one hand, but inversely to internal attribution of success or external of failure on the other (Stoeber & Becker, 2008). Interestingly, some superstitions tend to change according to the kind of sport, the athletic level and role, but also to the gender and the level of education, and seem to be specifically functional in agonistic sportsmen (Dömötör et al., 2016). Moreover, superstition behaviors seem to increase in parallel with higher levels of challenge, reflecting the importance of the competition, thus representing a coping mechanism of stress (Dömötör et al., 2016). Such considerations are in agreement with our findings showing increased rates of rituals, superstitious and magical thinking in active professional tennis players. Indeed, elite athletes in current activity undergo different stress factors when compared to past athletes, and gender may also represent a variable influencing the relationship between obsessive symptoms/rituals and competitive activity, as they are more common amongst women, as we also reported herein. Furthermore, previous researches discussed the presence of both a harmonious and an obsessive passion. The latter may

affect the overall wellbeing of the athletes and their performances, mainly due to an inflexible exercise behavior and, compared to the harmonious one, it seems to enhance the athletes' stress experiences (Schiphof-Godart & Hettinga, 2017). It also seems related to rigid and persistence behaviors, thus leading to a higher risk for exercise addiction that has been shown to be more prevalent amongst elite than in leisure athletes (Akehurst & Oliver, 2014; De la Vega et al., 2016; Lucidi et al., 2016; Nogueira et al., 2018). Unfortunately, by the time, the continuous research of perfection could potentially lead to detrimental outcomes, including aggressive and dangerous behaviors, severe psychiatric disorders, and impairment in social relationships (Stillman et al., 2016; Lichtenstein et al., 2017).

No information is available in the literature regarding the incidence of different subtypes of obsessions and compulsions amongst tennis players, so that our findings of some differences that, according to our knowledge, are the first of this kind, require to be replicated in larger samples of professional tennis players.

The analysis of depressive symptoms revealed no significant difference between tennis players and the control counterparts, with slight sex-related intra and intergroup differences in just a few items. The women of the athlete's groups showed a higher score of the item 18 "Less interested in work and hobbies" than men, while control women reported higher scores of items 5 - "Less interested in eating" and 9 "Throbbing" than men. Current athletes showed significantly higher scores of the item 3 - "Need of crying" and 16 "I feel uncertain and indecisive" than inactive athletes. Interestingly the item 16 is a hallmark of obsessionality.

The current knowledge on the prevalence of depression in tennis players is meagre, although it has overall emerged as the most frequent mental disorder among athletes, with variable rates, between 4% and 80%, and with symptoms that might be also differently perceived compared to the global population (Baillie et al., 2014; Doherty et al., 2016; Hammond et al., 2013; Prinz et al., 2016; Schaal et al., 2011). Different factors have been proposed to explain such differences, such as the kind of assessment, different sports or due to the role of gender (Wolanin et al., 2016; Szabo et al., 2019). It has been also suggested how individual sports, as it is the case of tennis, with the exception of group tournaments and team competitions, may lead to a greater vulnerability, in comparison to team sports (Nixdorf et al., 2013, 2016; Schaal et al., 2011). Furthermore, popular culture commending toughness in sport associated with the stigma about depression, and all major psychiatric disorders, is still a relevant problem nowadays (Uphill et al., 2016). It is worth mentioning that Andre Agassi, a legend of this sport, in his famous autobiography, reported his traumatic experience with depression and his love/hate relationship with tennis, up to the point of saying at some points of his career: "I hate tennis, hate it with a dark and secret passion" (Agassi and Moehring, 2009). Tennis literature, albeit limited allowed us to compare results of our study. Wughalter and Gondola (1991) evaluated the psychological profile of 16 professional female tennis players from the World International Tennis Circuit (WITC) by the Profile of Mood States questionnaire by comparing their scores to those of college-age women (Wughalter & Gondola, 1991). The authors highlighted lower scores on several items in the athletes group, thus concluding that tennis players were less depressed, tense, fatigue and confused than the control group. However, such findings have to be

considered cautiously, due to the small size of the sample (Wughalter & Gondola, 1991). Yazici et al. (2016) evaluated the effects of a tennis program consisting of 90-minute basic tennis skills lessons for 13 weeks on psychological well-being in a sample of 76 university students, by using the Symptom Checklist-90-Revised (SCL-90-R), the Beck Anxiety Inventory (BAI) and the Beck Depression Inventory (BDI) scales. By comparing the scores before and after their program, they found out a significant decrease in BDI and BAI scores, together with a significant decrease in several sub-scores of SCL-90-R, thus showing that performing tennis exercise once a week had led to reduced depression and anxiety symptoms and overall promoted well-being in young and healthy subjects (Yazici et al., 2016). Furthermore, our study showed no correlation between gender and the severity of depressive symptoms, in contrast with the literature. Such findings are at odds with most of the research on the matter. According to several authors, female athletes overall present a greater prevalence of depressive symptoms, as well as social anxiety and non-support among each other compared to both male athletes and non-athletes of both sexes (Hammond et al., 2013; Kelly et al., 1999; Storch et al., 2005; Wolanin et al., 2016; Yang et al., 2007). These data might be due to the fact that women in sports may be exposed to more stressors and may interiorize stressful situations in a different way, thus leading to an overall greater distress or they may frequently report less social support than male athletes which, on turn, may lead to a decreased ability in stress coping and consequently make them more vulnerable to depression (Storch & Masia-Warner, 2004; Storch et al., 2005).

However, it should be mentioned that the differences reported herein in comparison to other clinical researches may be due to some relevant limitation. First, the number of women in our groups was small, as it was the overall sample size. However, we would highlight the difficulty to especially recruit sport players in current activity before important international competitions, given their strict daily routine and constant repetitive feeling that they lose time, even for a medical consultation and psychological assessment. Second, the SAD is different from the tools used in most of the other studies, albeit with similar assessment of depressive and anxious symptoms. Third, our sample included just 25 athletes, of whom 13 were in current activity at the time of their recruitment, thus making it difficult to draw conclusions that can be extended to an entire sporting discipline. Fourth, for the reason reported at the first point, we could not more thoroughly administered self-instruments to assess subthreshold psychopathology, or to better define the athletes' personality, given their low compliance.

Conclusion

The present study demonstrated that professional tennis players show a relevant increase of obsessive-compulsive symptoms and superstitions than control subjects. Interestingly, current athletes resulted more severe than past ones. Taken together, our findings support the notion that agonistic sport activities of high level require intensive training and compliance to strict daily routines that might represent a sort of vulnerability towards the onset of symptoms that may be adaptive to obtain excellent results. However, when the expectation of good results is not met, the ranking is not maintained and a physical accident prevents regular training, competitions and impairs the

ongoing career, such symptoms may turn into a full-blown obsessive-compulsive or other disorders. Not surprisingly, sport psychological support experts are increasingly in demand, leading us to reflect on the necessity to helpfully prevent high stress levels, both during preliminary times and competitions.

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