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**The Effect of a Mindfulness Intervention on Spontaneous Self-Talk
and Subjective Performance among Young Football Players**

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ABSTRACT

This study examined the effectiveness of mindfulness intervention (MAC approach) on athletes' subjective performance, spontaneous self-talk and dispositional mindfulness of young Greek football players. Three local football teams were randomly allocated to control (no treatment) and experimental (MAC) group. The total of participants to complete the intervention were 46 (MAC=26, control=20) with a mean age 15.7 (SD=.82) years. Questionnaires were administered to the participants before and after the intervention (ASPS, S-STTS, MIS). Overall, the results did not show statistically significant effects for dependent variables, but revealed some notable trends for the MAC group to decrease negative retrospective spontaneous self-talk and increase awareness and non-judgementality, and keep stable subjective performance.

INTRODUCTION

Over the past few decades, sport psychologists over the world are working on cognitive strategies and techniques in order to lead athletes to the so called “optimal performance level”. Different kind of cognitive strategies have been evaluated to bring the desired outcomes for the athletes. Conversely, poor athletic performance outcomes have mainly been linked to negative internal processes (emotions, physical sensations and thoughts). As such, if negative emotions and sensations are decreased, then this could cause an increase in positive cognitions and confidence levels, as a result, the optimal performance level (Hardy et al, 1996).

The above processes are the cause of psychological skills training (PST) approaches used in sport psychology as cognitive strategies and techniques helping athletes change the content of their internal thoughts, emotions and sensations. The theoretical background over these interventions, is based on cognitive behavioral therapy which is based on the idea that the desired outcome or behavior depends on how one responds to their internal states, the thoughts, emotions and bodily experiences (Röthlin et al, 2016).

As Weinberg & Gould (2003) have stated, “desired behavior change is mainly a result of distractions that have been changed, controlled or avoided in an athlete’s cognitive processes” which also leads to the perception that an athlete’s performance to a specific event can be affected of the cognitions they have built around this specific event. That kind of cognitions, could be explained as learned emotional responses to people, things and ideas which are able though to affect an athlete’s performance and in parallel their well-being (Carson & Langer, 2006).

While PST interventions use cognitive strategies to change the content of these cognitions such as positive self-talk to raise their confidence (Hatzigeorgiadis, Zourbanos, Galanis & Theodorakis, 2011), or relaxation to reduce what is perceived as problematic anxiety (Greenspan & Feltz, 1989), there is a “third wave” of approaches based on behavioral therapy with their cause being to change the relationship one has to their internal experiences rather than the content of them (Röthlin & Birrer, 2019). Part of these “third wave” approaches is also mindfulness-acceptance-commitment (MAC) approach used as an intervention to the present thesis.

It has been stated that MAC approach is a promising performance enhancement approach that could be used to individual or group settings (Gardner & Moore, 2007). To concentrate to this type of approaches using mindfulness as a part of the intervention to affect performance enhancement, it is important to refer that PST interventions results in well-being, in characteristics such as psych up or stress reduction or confidence levels are undeniable (Daw & Burton, 1994). Though, an important critique to mindfulness approaches came up by Ravizza (2002) who stated that “an optimal state of mind can be experienced and achieved only for a short time within the athletic performance”, which means that it is impossible for an athlete to be in absolute control of their internal states long-term or even during the whole time they are competing.

A second important point that has been posed by Gardner (2006) as a thought-provoking point is the counterproductive effect for an athlete to locate and control their internal experiences. As Gordon and Gucciardi (2011) mentioned “this trial may trigger the continuous athlete’s focus on the negative thoughts”, which states us to realize that an athlete is facing a paradoxical effect, other than training them control of negative effects as their thoughts or sensations, guiding them to this continuous energy consuming search circle. Based on that, the urge is to move our focus on athletes’ strengths instead of weaknesses, and how to control and reduce them (Gordon & Gucciardi, 2011).

By doing so, athletes can shift their attention to the important components of skill execution other than the content of their thoughts (Noetel et al., 2017). Before proceeding to understand the therapeutic approaches constitute the so called “third wave” therapy and the basic components of them, it would be meaningful to understand where mindfulness approaches come from.

The History of Mindfulness

Despite the last decade’s mindfulness junction with sport psychology interventions or its contribution in psychotherapy, mindfulness is not a new coming structure. The foundations of mindfulness originated from Buddhist and Hindu spiritual traditions (Johannsen et al., 2022). People have been practicing mindfulness for thousands of years, either on its own as a practice or as a part of larger traditions. The word “mindfulness” comes from the word “sati” which means awareness, attention and remembering in Pali language, which is the language used in Buddhist philosophy and

psychology (Siegel et al., 2009). The definition of mindfulness though, has been somewhat modified in order to use it in modern psychotherapy.

The purpose of mindfulness in its ancient context was to eliminate negative feelings and suffering by “cultivating insight” on how mind works and which is the nature of our world. In today’s context, mindfulness as part of psychotherapy seeks to lead a patient to change through the quality’s Buddhism philosophy gave to it (awareness, attention and remembering), but also with new ones such as nonjudgement, acceptance and compassion, components of which the understanding comes up next.

Jon Kabat-Zinn (2003) have been influential in establishing mindfulness meaning and affect in the western world. He defines mindfulness as “the awareness that emerges through paying attention on purpose, in the present moment and nonjudgmentally to the unfolding of experience moment to moment”. It is important to note that mindfulness was introduced first to the United States by 19th century from Chinese immigrants and adopted by psychoanalytic and existential psychotherapists at the beginning of 20th century (Williams & Lynn, 2010). The social psychologist, Ellen Langer, played an important role in introducing it to academic psychology.

Having a basic idea of how mindfulness met psychotherapy, it is considered of great importance to deepen in the basic components of mindfulness-based approaches and their theoretical background.

Theoretical background and basic components of mindfulness-based approaches

The goal of mindfulness interventions is to increase both cognitive and behavioral flexibility through cultivating the ability to adapt to the environment in a meaningful way (Carson & Langer, 2006). According to the psychological interventions including mindfulness, a person can act either in a mindful condition or with mindlessness. By the phrase “someone is mindful” it is meant that one is engaged in the present moment, the here and now, and able to recognize both the context and the perspective of this particular moment. Mindlessness on the other hand, can be perceived as an automatic action characterized by a single perspective. This perspective is mainly driven by the schemas (rules, routines, previous experiences) or the internal rules one has grounded on (Carson & Langer, 2006).

The “third wave” behavioral therapy adopted mindfulness as part of the approaches to “train” individuals or groups to act mindfully. As Coffey et al. (2010)

stated, mindfulness leads to better clarity of one's internal world as a response to choose the appropriate behavior when the negative affect is present. Being in a mindful condition, allows people to experience every moment as a result bonding their touch with reality and through this process promoting positive outcomes to their mental health (Googhari et al.,2022). Well stated by Johannsen et al. (2022), mindfulness is described as an “active verb”, an active recognition and acceptance of the totality of their experience. It contains “conscious contact” through promoting attention and awareness and replaces avoidance and resistance with recognition and acceptance.

Main and important approaches and therapies constituting the background for the rest interventions are: Mindfulness-based Stress Reduction (MBSR), Mindfulness-based Cognitive Therapy (MBCT), Dialectical Behavior Therapy (DBT) and Acceptance-Commitment Therapy (ACT). Through these therapeutic interventions, mindfulness is a key on promoting non-judging awareness of both internal (thoughts, emotions, sensations) and external stimuli (Moore, 2009). It is meaningful to mention here that in the present thesis, ACT is going to be described more extensively not because it is considered more important than the rest, but because it constitutes the background for MAC approach by Gardner and Moore (2007) which has been the intervention used for our cause.

More specifically, ACT was developed by Hayes in 1986. The aim of the therapy is to promote psychological (cognitive) and behavioral flexibility through cultivating acceptance of internal experiences, bodily sensations and external stimuli no matter the content of them (even when they are considered as unwanted) (Gardner & Moore, 2007; Hayes & Brownstein, 1986; Moore, 2009). By the term “psychological flexibility”, Hayes referred to the ability to conform in every content and accept experiences in their “pure form” by showing awareness in the present moment driven by specific values and showing commitment to them through behavioral choices. It is important to mention that some mindfulness and acceptance interventions focus on forming and commitment of values and values driven behavior (Moore, 2009) where others forgo this process entirely (e.g. Kaufman, Glass, & Arnkoff, 2009).

Mindfulness- and acceptance-based interventions (MABIs) differentiate from mindfulness therapies in promoting the acceptance as an extra content and the most common used are: Mindfulness-Based Therapy (MBT), Acceptance and Commitment Therapy (ACT), Meta-Cognitive Therapy (MCT) and Acceptance-Based Behavior

Therapy (ABBT) (Johannsen et al., 2022). In mindfulness and acceptance-based therapies, the three main aspects are “mindful attention”, “decentering” and “acceptance” though being portrayed differently in each one of them. Even so, their link as mediators for positive outcomes is undeniable (Googhari et al., 2022).

In contrast to cognitive behavior therapies (CBT), MABIs aim to change the relationship one has with their internal experiences (thoughts, emotions, sensations), rather than changing the content of them, controlling or replacing them (Gardner & Moore, 2012). ACT assumes that human language can cause “psychological suffering” because of the internal rules and schemas built which turn language equivalent to the specific event linked (Moore, 2009). This is the relationship MABIs attempting to change by using language more as a tool to observe and express the internal experiences, rather than to judge them as positive or negative, bad or good (Hayes et al., 2013).

The growing popularity and positive outcomes of MABIs in literature, led to the development of three sport-specific mindfulness-based intervention models: the Mindfulness, Acceptance and Commitment approach (MAC, Gardner & Moore, 2007) used in present thesis, the Mindfulness Sport Enhancement Program (MSPE; Baltzell & Akhtar, 2014) and the Mindfulness Meditation Training for Sport (MMTS; Kaufman, Glass, & Arnkoff, 2009). Even though all three interventions have been used to effectively affect human performance in sports, MAC approach is going to be further described for the need of the present thesis.

MAC approach suggests that the optimal performance state for an athlete can be achieved even when discomfort is present (Moore, 2009). Discomfort may be brought on by internal experiences, thoughts or emotions, bodily sensations or external stimuli, even so, MAC approach enhances the ability of athletes to reach to their peak performance and feeling, and accepting discomforts. According to Gardner & Moore (2007) feeling discomfort and performing optimally doesn't have to be two separate acts that an athlete has to choose either one or the other, on the contrary, both can happen simultaneously without one affecting the other.

The three main components of the program as summarized by Moore (2009) are: mindful attention, non-judging acceptance of discomforts, and reconstitution of values and committing to them. Mindful attention is one of these important components. What is meant by this term is, the process where one can step back and

observe one's thoughts and reactions or sensations as being separate from the self, as a "third person". Moving on to the next step, important to the program, is decentering, distancing or as Gardner and Moore (2007) refer to it "defusion", which is the process of observing or moving the attention mindfully, with "mindful awareness" (another important component of the approach) or consciousness to a series of reactions without judging them and without having the need to do anything with them. Since all the important components are connected and acting like steps, one leading to the other, mindful attention, awareness and defusion lead to what the authors call "experiential acceptance", which refers exactly to this process where one not only is noticing or observing their experience but they also embracing it without defense (Johannsen et al., 2022).

At this point though, it should not be omitted that some authors argued to this strong connection and relationship Gardner & Moore noted between defusion and experiential acceptance. The disagreement lies in that the process of distancing oneself and the distressing experiences is not leading automatically to acceptance (Brown & Ryan, 2003). As Herbert and Forman (2011) proposed, even if it is true that enhancing defusion through the use of strategies leads to the enhancement of acceptance as well, it is not an automatic action. Instead, "experiential avoidance" which is described by Hayes et al. (2013), as "the attempt to alter the form, frequency or intensity of thoughts, feelings, bodily sensations or memories, even when doing so is costly, ineffective or unnecessary", is considered more as an automatic response to avoid discomfort affected by the schemas, internal rules one has created to a certain event.

To highlight this important point though, MAC approach is seeking to create what is called "psychological flexibility" in which Bond et al. (2011) refer to as the "ability to fully contact to the present moment, thoughts and feelings it contains without needless defense and depending upon what the situation affords, persisting in or changing behavior in the pursuit of goals and values", which clarifies that when one can attend mindfully to the present moment, decentering from the self and act with "mindful awareness", leads to the ability to choose the behavior bringing them closer to their goals and values. Value clarification and commitment to them are both of great importance in MAC approach and they are considered as the central element to guide the behavior instead of emotion.

The MAC program other than the number of techniques and exercises aim to increase mindful attention, mindful awareness and non-judgmental acceptance, emphasizes also to the need to help individuals to show willingness to come in touch with their internal experiences no matter what the content of them is, in order to be able to show consistency and commitment to value driven behavior (Gardner & Moore, 2007, Gross et al., 2016). As Gross et al. (2016) recorded, these techniques mentioned above, are mainly used to target the mechanisms of change the program suggests: attentional awareness, non-judgmental task-relevant focus, improved emotion regulation and greater psychological flexibility.

Mechanisms Affected by Mindfulness- and Acceptance-Based Interventions

Trying to explain and comprehend on how MABIs can affect human performance in general and lead to change, theoreticians propose that the effectiveness of this kind of interventions lies in the fact that they reduce ironic rebound effects and reinvestment (Noetel et al., 2017). Ironic rebound effect or white bear effect as it is also called, refers to the process by which the willingness to defeat or extinguish thoughts or emotions has as a result to increase instead of decreasing their presence and the attention paid to them (Wegner, 1994). This process explains what was mentioned earlier about the constant need to control and decrease thoughts, leading to an energy consuming circle which summarizes the critique to PST coming by Gardner and Moore (2007) and Gordon and Gucciardi (2011) as a paradoxical effect.

MABIs overcome the effects that ironic rebound can cause by endorsing acceptance instead of defeating thoughts or feelings and by that way, attention is redirected to more useful cues related to performance rather than the content of the thought (Birrer et al., 2012). As Janelle (1999) stated, the theory of ironic mental processes explains “the tendency to feel, act and think in ways that are opposite to the intended direction of emotion, behavior and cognition”. Ironic rebound effects are linked with the tendency to control psychological states and processes in order to achieve personal goals. Athletes who experience irrelevant thoughts to an important moment for their performance, try to invest effort in focusing on task-relevant information and this has as a result for them to lose their behavioral flexibility, flow, and automaticity of their performance since their effort and attention is lost in the process of controlling (Birrer et al., 2012).

Reinvestment theory states that automatic movement will be disrupted when the athlete consciously implies to control it (Masters & Maxwell, 2008), which means, when the athlete is involved in self-evaluation processes and attempting to judge which thoughts and emotions best fit the behavior related to their personal goals. Though, this could be avoided if athletes stop getting involved in this constant need for control and evaluation (Birrer et al, 2012). As Master and Maxwell (2008) basically stated, the unhelpful shifts in attention, can be the reason to cause performance impairment.

From the above, it could be easily clear that mindfulness and acceptance interventions can affect performance through decrements in these two: ironic rebound effect and reinvestment since the processes that they affect, are the ones that MABIs are promising to enhance like mindful attention, awareness, gaining emotional, and behavioral flexibility, as mentioned earlier. At this point, it should not be omitted to turn our attention to the mechanisms by which mindfulness meditation, which is the common element of all the interventions that have been developed even if it differs in points in each one of them, exerts its effects.

According to Hölzel et al. (2011), based to their review, the mechanisms of action through which mindfulness works, constitutes also its important components and these are: attention regulation, body awareness, emotion regulation, and change in perspective on the self. It should be clear though, that among mindfulness-based interventions, mindfulness meditation differs (e.g. in MAC approach, the compassion meditation from MMTS is not a part of practice, but it is cultivated throughout the acceptance and non-judgmental attitude to one's self) so it is meaningful to investigate which components are involved each time, and which are the ones that individuals need to cultivate. Evidence suggests though that these different components of mindfulness meditation implement neuroplastic changes in the brain as well, namely: in the anterior cingulate cortex, insula, temporo-parietal junction, fronto-limbic network and default mode network structures as it is examined in Hölzel et al. (2011) review.

The above authors, suggest that each component of mindfulness meditation should be both differentiated from one another since they are connected in different neuroplastic changes but also as a complete model including all of them in order for future research to clarify the mechanisms by which mindfulness interventions affect clinical and non-clinical aspects of human performance in sports.

Mindfulness Interventions in Sports – Mental Health

Mindfulness-based interventions have been widely used in clinical domain and psychotherapy, but the last decades they are gaining ground in sport psychology and even physiotherapy. Meta- analyses in both clinical and subclinical domain have proved that mindfulness-based interventions have positive effects in psychological conditions such as depression, chronic pain, eating disorders, anxiety, alcohol/substance use concerns, trauma-related issues and sleep (Gardner & Moore, 2017). Though, these kinds of interventions have demonstrated positive effects and benefits for people and athletes who are not in clinical distress as well, but want to benefit in domains such as performance and general well-being. It is worthy to note that in sport psychology, where the interest is turned for the needs of the specific study, the results of meta-analyses in literature have shown contradictory effects which imposes the need for further research and clarifications.

According to a current meta-analysis (Wang et al., 2023), mindfulness-based interventions are proven to be effective in promoting performance, mindfulness levels, psychological components such as acceptance, flow, and psychological flexibility, but effects on athletes' mental health have not been considered significant. In addition, Johannsen et al. (2022) agreed to the inconsistencies in literature through their review which focused on the effects of meditation-based interventions on depression and anxiety, and the possible indirect effects of attention, decentering, and acceptance. Furthermore, Ólafsson et al. (2011) substantiated that high attentional control as a result of MBIs is associated with lower anxiety and depression, while Van Aalderen et al. (2011) proved that non- judgmental acceptance is the only faced mediating effects on depressive symptoms.

It is important to state that a big part of literature concerns about the effects that MBIs have on mental health which is a topic closely linked with sports since athletes have to deal with lots of challenges and pressure which can easily lead to stress anxiety, burn-out, and even depression. Among others, studies have been revealed positive effects of MBIs on athletes' overall mental health (Dehghani et al., 2018; Gross et al., 2016; Sadimi et al., 2021). Finally, Mozafari et al. (2019) added to these positive effects by evincing lower anxiety of sport injury for a mindfulness intervention group compared to control, while Wolch et al. (2021) examined the effects during a phase-

pressure situation proving less cognitive and somatic anxiety for the mindfulness intervention group.

Mindfulness Interventions in Sports – Performance

In competitive sports, usually if not always, the main goal of athletes is to reach what is called “the optimal or ideal performance state” or differently “being in the zone” as it is described as a subjective state of performance. This has as a result, all professionals who deal with the athlete, working constantly on finding ways to help the athlete conquer this desired state. For that reason, mindfulness-based interventions literature and research is constantly in progress to prove positive effects of mindfulness approaches on performance. Many studies have noted significant positive effects of mindfulness approaches on sport performance (Dehghani et al., 2018; Naderi et al., 2020; Wolch et al., 2021).

Specifically, Josefsson et al. (2019) and Glass et al. (2019) turned their interest on self-rated sport performance which seemed to be increased for the mindfulness intervention group compared to the control, while Lundgren et al. (2021) focused on objective performance outcomes such as goals, assists and taker shots in hockey players, but also coach ratings to assess and prove the significant effects of ACT intervention compared to control group. In addition, Kaufman et al. (2009) stated that the improvements found after applying a mindfulness meditation training program (MSPE) were in constructs related to performance, but not performance itself, which finds agreeable the effects of the same program in De Petrillo et al. (2009) study where mindfulness was increased and sport-related worries decreased for athletes. Moving on it is essential to pay attention on which are these constructs related to performance.

MBIs and Mindfulness

When the term “mindfulness” is used, there are two facets in which this term refers to mindfulness practice, which are the methods through which mindfulness is promoted, and dispositional mindfulness, which describes the tendency to be mindful in everyday life (Birrer et al., 2012). More specific, dispositional mindfulness seems to play the role of mediator in the relationship between the mindfulness-based intervention and its effectiveness on improving skills related to performance, but also the performance itself.

The above statement finds in agreement Josefsson et al. (2019) which showed that MAC approach had an indirect effect on self-rated performance through changes in both dispositional mindfulness and emotion regulation. Carraca et al. (2018), Rötlin et al. (2016), and Mozafari et al. (2019) established that mindfulness-based interventions (e.g. MAC in the last reference) led to improved mindfulness levels compared to control groups. It is worthy to be noted that Rötlin et al (2016) compared the mindfulness intervention group with the control who performed PST.

Moreover, Bagheri et al. (2020) associated increased mindfulness with decreased pain levels, which means that mindfulness showed a mediator role once again. For better understanding of literature results, Birrer et al. (2012) created a theoretical model in which mindfulness practice and dispositional mindfulness (as a trait which involves attention, awareness, and acceptance) generate mechanisms which are affected from mindfulness (e.g. acceptance, attention, emotion regulation) which in turn promote psychological skills such as motivation, coping, recovery which are related to performance.

Mindfulness though has been also linked, at least theoretically, with flow since Kaufman et al. (2018) suggested that there are elements of flow such as loss of self-consciousness, transformation of time, merging of action and awareness, which are similar to mindfulness characteristics like acceptance and awareness, which is something which fuels thought about the effect flow has in the relationship of mindfulness-based interventions and performance.

MBIs and Spontaneous Self-Talk

Spontaneous self-talk has been defined as “thoughts that are linked to the task at hand and are focused on relevant stimuli but are unintentional, non-working, and non-instrumental thoughts that come to mind effortlessly and unprompted” (Latinjak et al., 2014). Focusing on sport contexts, spontaneous self-talk refers to “an intuitive type of self-talk that is fast, effortless, focusses one’s awareness on current experiences and is emotionally charged” (Latinjak et al., 2019).

Taking into consideration that emotions and behaviours are products of one’s thoughts and internal dialogue, and may the concepts of mindfulness and self-talk share associations with a particular state of consciousness, as in both cases the concepts require the individual to be consciously aware of both their internal and external

experiences, Birrer et al. (2020) suggested that we can move from the traditional self-talk intervention (e.g. using cue words) to mindfulness- and acceptance-based interventions in order to alter or modify emotions and behaviors in a desired manner.

Even though self-talk has not been examined as much as the previous constructs in the MBIs literature, it is gaining ground the last decade. To the MBIs literature, self-talk has been linked with self-compassion which constitutes a construct that mindfulness interventions aim. Georgakaki and Karakasidou (2017), pointed out that self-talk leads to positive affective states and to an increase in general self-compassion attitude. In addition, according to Grzybowski & Brinthaup (2022) positive self-talk relates both to trait mindfulness and self-compassion through a positive connection which means that a positive intrapersonal communication enhances the development of mindfulness and self-compassion. However, increases in self-managing self-talk were not related to positive self-communication and self-compassion, which agrees with Brinthaup (2019) and cognitive disruption hypothesis stating that cognitive-disruptive experiences related to self are associated with increased self-talk frequency.

It is worthy to note that Leary and Tate (2007) while examining mindfulness as a multi-faceted structure proposed “diminished self-talk” as a facet of mindfulness explaining that mindful attention can be achieved through reducing one’s inner self-talk since inner self-talk relates to self-evaluation and judgment. Indeed, in mindfulness practice people are taught to observe their thoughts but quit their judgmental self-talk by returning their attention to their breath. From the above though, it is clear that the authors referred to negative self-talk is “inappropriate, irrational and counterproductive” or a “form of criticism” as referred by Moran (2016). On the other hand, positive self-talk is the one that helps the athlete to focus attention in the present (Weinberg, 1988) which assumed to connect with mindfulness in a different way.

Moving on, according to Dialogical Self Theory (Hermans, 1996) individuals who report frequent ruminative inner dialogues might also report higher levels of self-critical or negative self-talk. Oles et al. (2020) have connected self-talk as one kind of intrapersonal communication which is similar to inner dialogues and stated that there is a significant component of self-talk to internal dialogues. As mentioned earlier, Mao et al (2023) in their meta-analysis confirmed positive impacts of MBIs in improving ruminative thinking which seems promising for negative thinking as well, considering the above. It should not be omitted that Kross et al. (2014), referred to self-talk as a

regulatory mechanism and a form of self-distancing through the ways a person refers to the self usually using non-first-person pronouns. Distancing or else decentering and emotion or self-regulation are major components of MBIs approaches as mentioned earlier.

However, although these bits of evidence exist to support the relationship between mindfulness and self-talk, there is insufficient evidence to interpret the relationships between mindfulness, spontaneous self-talk, and athlete's subjective performance in team sports.

Purpose of the present thesis

Taking into consideration all the above findings in literature, the present thesis aimed to examine the effectiveness of MAC approach in team sports, providing evidences to further support the positive relationship between mindfulness and athlete's subjective performance, and to investigate the effects on athlete's spontaneous self-talk and dispositional mindfulness.

METHODS

Participants

Originally, 52 young football players were sampled. Participants were members of different football teams training in different football courts. The teams were randomly assigned as experimental ($n = 28$ football players) and control ($n = 24$ football players). For the experimental group 26 football players completed the intervention and two withdrew before the conclusion of the intervention due to injury, while for the control group two football players did not participate in the post-intervention measurement and two withdrew due to injury. As a result, the control group finally consisted of 20 football players. For the 46 football players (males) who were included in the study, the mean age was 15.7 ($SD = .82$) years and all of them competed to local level.

In more detail, the 26 participants of the experimental group were football players, aged between 15 to 18 years old ($M = 15.9$, $SD = .89$) who are playing football 4 to 12 years ($M = 7.8$, $SD = 2.3$) and participating in games 2 to 12 years ($M = 7.2$, $SD = 2.7$). The years of being part of this team ranged from 1 to 10 ($M = 4.3$, $SD = 2.6$) as well as the years of having the same coach ($M = 3.3$, $SD = 2.3$). The times of their active participation in games, the last 4 weeks fluctuated from once to 4 times ($M = 3.1$, $SD = 1.14$) with their training hours being 4.7 ($SD = 1.45$) hours.

The control group were 20 football players of the same category to the experimental group. The age of the participants ranged from 15 to 17 years old ($M = 15.5$, $SD = .68$) and they were playing football 2 to 12 years ($M = 7.3$, $SD = 2.8$) with active participation in the same team ranged from 1 to 10 years ($M = 4.2$, $SD = 2.07$) but they had the same coach 2.5 ($SD = 1.0$) years. Finally, the last 4 weeks they had active participation in games 2.5 ($SD = 1.09$) times and their hours of training per week were 7.4 ($SD = 1.09$) hours.

Materials

Athlete's Subjective Performance Satisfaction Scale (ASPS): The Athlete's Subjective Performance Scale (ASPS; Nahum et al., 2016) was used to assess the athlete's subjective performance in team sports. The scale comprises 6 items assessing three dimensions: (a) general performance (e.g. "Overall – to what extent are you satisfied with your sporting performance this week"), (b) team contribution (e.g. "To what extent

did you contribute to the success of the team this week”), and (c) personal ability (e.g. “To what extent were your capabilities truly reflected this week”). Responses were given on a 10-point Likert scale ranging from 1 (not at all) to 10 (completely satisfied). Cronbach’s alphas for the pre-intervention competition ranged from .65 to .75, and for the post-intervention competition ranged from .70 to .83.

Organic Self-talk Questionnaire - Spontaneous Self-talk Scale (S-STS): The Spontaneous Self-Talk Scale was used to assess the dimension of spontaneous self-talk. The scale is part of the Organic Self-talk Questionnaire (OSTQS; Karamitrou et al., 2023) and comprises 20 items assessing four components of spontaneous self-talk: (a) retrospective-positive self-talk (5-items), (b) anticipatory-positive self-talk (5-items), (c) retrospective-negative self-talk (5-items), and (d) anticipatory-negative self-talk (5-items). Responses were given on a 5-point Likert scale ranging from 0 (never) to 4 (very). Cronbach’s alphas for the pre-intervention competition ranged from .73 to .85, and for the post-intervention competition ranged from .80 to .84.

Mindfulness Inventory for Sport (MIS): The Mindfulness Inventory for Sport (MIS; Thienot et al., 2014) was used to assess the dimension of mindfulness. The questionnaire comprises 15 items assessing three components of athletic mindfulness: (a) present moment awareness (e.g. “I am able to notice the intensity of nervousness in my body”), non-judgmentality (e.g. “When I become aware that I am thinking of the final result, I blame myself for not being focused on relevant cues for my performance”), and ability to refocus (e.g. “When I become aware that I am tense, I am able to quickly bring my attention back to what I should focus on”). Responses were given on a 6-point Likert scale ranging from 1 (not at all) to 6 (very much). Cronbach’s alphas for the pre-intervention competition ranged from .60 to .76, and for the post-intervention competition ranged from .75 to .85.

Procedure and Intervention

The institution’s ethics committee provided permission for the conduct of the study (ref: 2141). The intervention included three phases: (a) pre-intervention phase, (b) intervention phase, and (c) post-intervention phase.

Pre-intervention phase: Firstly, all football players, coaches, and football players’ parents of the experimental group received instructions regarding the requirements and the procedures of the intervention. They were also informed that

participation was voluntary and that they could withdraw from the intervention at any time. Subsequently, football players' parents signed a consent form. Finally, football players completed the questionnaires mentioned above. Similarly, all football players, coaches, and football players' parents of the control group, after being informed about the purpose of the study, provided us the permission to collect the data (questionnaires) and signed the consent forms.

Intervention Phase: The duration of the intervention (Mindfulness-Acceptance-Commitment approach; Gardner & Moore, 2007) was seven weeks and the frequency of delivery was once per week (50-minute sessions). MAC approach is a step-by-step protocol to enhance performance consisting of seven modules (sessions). Every session had the form of workshops with educational presentations conducted from the researcher according to Gardner & Moore's protocol.

Module 1: Athletes' preparation through Psychoeducation (1) which consists of an introduction to the program, the presentation of its theoretical rationale, the connection of the rationale with athletes' personal experiences, the explanation of automated self-regulation in performance, definition of specific goals of the program and introduction of athletes' first practice through the "Brief Centering Exercise" which includes one of the basic tools used in every session of the program.

Module 2: Introduction of Mindfulness and Cognitive Defusion (2) which starts and ends with the "Brief Centering Exercise" to help the athletes both familiarize with practicing mindfulness and to enhance their attention in the present moment. Discussion of exercises and forms given to the athletes at the end of every session, but also the difficulties they met to complete them consist part of the program.

Module 3-7: Moving on, the rest of the modules are the following: Introduction of Values and Value-driven behavior (3), Introducing Acceptance (4), Enhancing Commitment (5), Skill Consolidation and Poise, Combining Mindfulness, Acceptance and Commitment (6), and Maintaining and Enhancing Mindfulness, Acceptance and Commitment (7). In this last module, ways of practicing the techniques and skills gained from the program in the future are discussed.

It should not be omitted that in every session, besides "Brief Centering Exercise", different mindfulness techniques and exercises were introduced to the athletes and were required from them as "self-practice". By the end of every session, recordings with mindfulness exercises were promoted to the athletes in a group chat.

The completion of self-practice as well as the assimilation of each module's components were part of in sessions discussions. There was no strict requirement from them to complete it other than the embrace of the importance and impact on their performance. All the materials used in this study can be seen in more detail in Appendix.

Football players of the control group followed their usual training program. They were informed that training attendance would be recorded and were told that it would be important to attend all the scheduled training sessions. After the completion of the study, football players of the control group were debriefed MAC approach.

Post-intervention phase: After the 7-week intervention, data collection was conducted next day of the last module session. The participants were required to complete the same questionnaires as to the pre-intervention phase. It is meaningful to mention that all the sessions were programmed same day and time each week though adjustments due to weather conditions were not skipped. Since all measurements conducted on the field.

RESULTS

In order to examine the hypothesis according to the dependent variables of the present study (athletes' subjective performance, organic spontaneous self-talk, mindfulness), a series of repeated measures MANOVAs conducted.

A two-way (2×2) MANOVA with one repeated factor (time, pre- and post-intervention) and one independent factor (group, experimental and control) was performed to examine for differences in athletes' subjective performance between pre- and post-intervention for the two groups. The analysis revealed a non-significant multivariate group by time interaction, $F(1, 44)= 2.83, p= .09, \eta^2= .06$. The pattern of athletes' subjective performance changes from pre to post-intervention for the two groups is displayed in Figure 1.

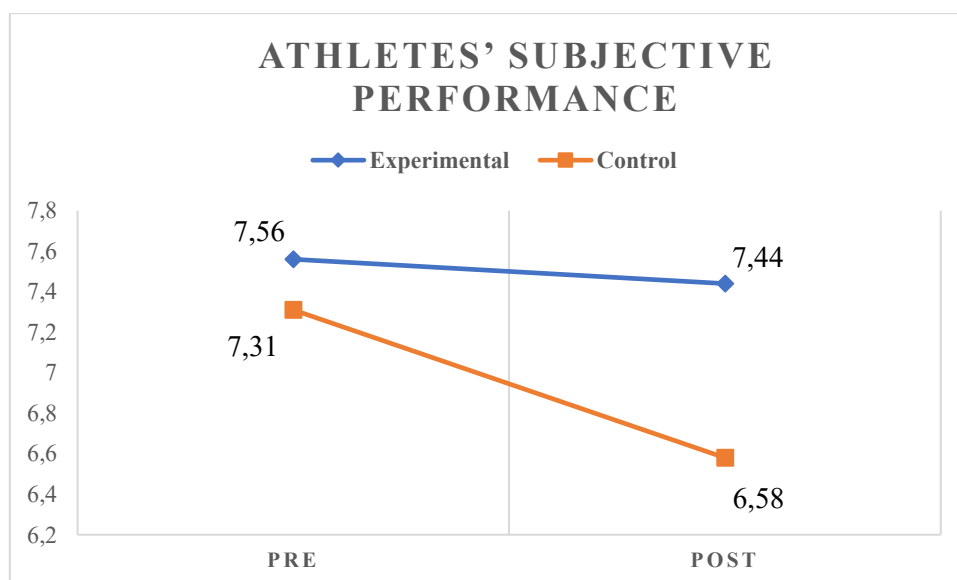


Figure 1. Athletes' subjective performance changes.

A two-way (2×2) MANOVA with one repeated factor (time, pre- and post-intervention) and one independent factor (group, experimental and control) was performed to examine for differences in athletes' organic spontaneous self-talk (retrospective-positive, anticipatory-positive, retrospective-negative, and anticipatory-negative) between pre- and post-intervention for the two groups. The analysis revealed a non-significant multivariate group by time interaction, $F(4, 41)= 0.32, p= .85, \eta^2= .03$. Examination of the univariate statistics revealed non-significant time by group

interaction for retrospective-positive self-talk, $F(1, 44)= 0.30, p= .58, \eta^2= .007$, for anticipatory-positive self-talk, $F(1, 44)= 0.08, p= .73, \eta^2= .002$, for retrospective-negative self-talk, $F(1, 44)= 1.25, p= .26, \eta^2= .02$, and for anticipatory-negative self-talk, $F(1, 44)= 0.01, p= .91, \eta^2= .001$. The pattern of athletes' organic self-talk changes from pre to post-intervention for the two groups is displayed in Figure 2.

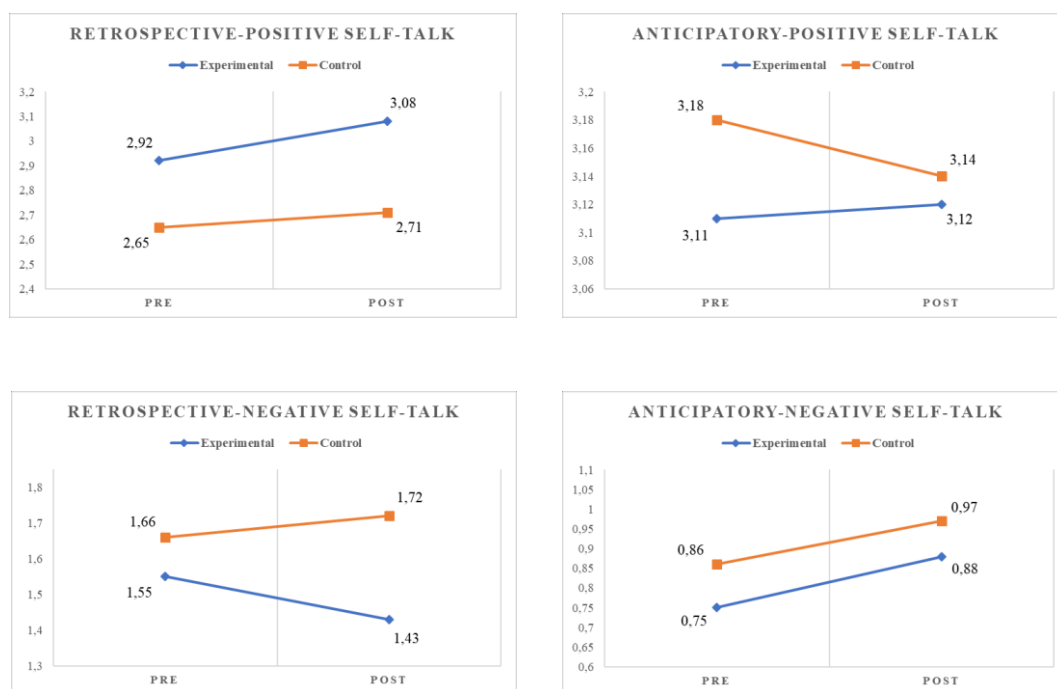


Figure 2. Athletes' organic self-talk changes.

A two-way (2×2) MANOVA with one repeated factor (time, pre- and post-intervention) and one independent factor (group, experimental and control) was performed to examine for differences in athletes' mindfulness components (present moment awareness, non-judgementality, and ability to refocus) between pre- and post-intervention for the two groups. The analysis revealed a non-significant multivariate group by time interaction, $F(3, 42)= 1.26, p= .29, \eta^2= .08$. Examination of the univariate statistics revealed non-significant time by group interaction for awareness, $F(1, 44)= 3.51, p= .06, \eta^2= .07$, for non-judgementality, $F(1, 44)= 1.34, p= .25, \eta^2= .03$, and for refocus, $F(1, 44)= 2.27, p= .13, \eta^2= .04$. The pattern of athletes' mindfulness changes from pre to post-intervention for the two groups is displayed in Figure 3.



Figure 3. Athletes' mindfulness changes.

DISCUSSION

The purpose of the present thesis was to examine and clarify the contradictory results in literature regarding the relationship between mindfulness, athletic performance, and other psychological factors. In order to investigate this relationship, a MAC approach was used to examine the effectiveness of this program on athlete's subjective performance, spontaneous self-talk and mindfulness among young football players. Overall, the results of the present thesis did not provide support for our hypotheses, as MAC intervention was not shown to have statistically significant effects on our dependent variables, mindfulness, organic spontaneous self-talk, and subjective performance.

Regarding subjective performance, it was hypothesized that MAC intervention would increase athletes' subjective performance, but however, there were non-statistically significant effects of time, group or interaction for the groups. Even though the results recorded, were not statistically significant, there was the tendency for the MAC group to keep the scores stable across time in contrast to control where decreased. These findings are partially supported by Gross et al.'s (2016) findings who also noted non-significant results for performance between MAC and control group, though confirmed a within effect for MAC group.

In addition, concerning spontaneous self-talk, it was hypothesized that intervention would increase athletes' positive retrospective and anticipatory spontaneous self-talk and decrease negatives, but however, there were non-statistically significant effects of time, group or interaction for the groups. Even so, experimental group tended to decrease negative retrospective spontaneous self-talk and showed stability on positive spontaneous self-talk compared control group who tended to decrease positive anticipatory spontaneous self-talk. Though little previous research had been done into this relationship, these results are in the same line of Baltzel and Akhtar (2014) findings, who proposed that their mindfulness intervention group remained stable on negative affects compared to control who showed significant increase in negative affect across time.

Furthermore, considering dispositional mindfulness, it was hypothesized that intervention would increase the three components of mindfulness, but however, there were non-statistically significant effects of time, group or interaction for the groups.

Nevertheless, experimental group tended to significantly increase awareness and non-judgmentality, and showed stability on the ability to refocus. These results, come to an agreement with Giges and Reid's (2016) findings, who showed increased overall self-awareness combined with increased acceptance of mental and emotional content for their mindfulness intervention group. In addition, Cash and Whittingham (2010) proposed that different components of mindfulness make different contributions to psychological processes and lead to different benefits.

Overall, the unexpected non-statistically significant results found throughout the present thesis may be due to several notable limitations. First, the researcher who implemented the intervention program, had no previous experience with mindfulness-based interventions and MAC approach specifically. Secondly, the young age of the football players may have led to an insufficient understanding of the concepts of mindfulness as an enhancing performance technique. Thirdly, the available time for implementing the intervention sessions (in- and out-session practice) was quite limited for the in-depth explanation of the mindfulness concepts. Previous studies have been mentioned that younger subjects might have limited ability to apply adequately a mindfulness program because of incomplete maturation (Buhlmayer et al., 2017) and high number of sessions accompanied by time demanding out-session practice may not be available for some athletes, especially of young age-groups (Baltzel & Akhtar, 2014).

In conclusion, the results of the present thesis did not provide support for prior findings that mindfulness-based interventions would be positively related to increases in sport performance and for the proposed theoretical link between mindfulness and spontaneous self-talk in sport. However, despite the limitations of the study, the results showed some positive trends of MAC approach in some of the dependent variables and provided to the football players with skills they planned to continue using moving forwards. Future research in this area, could take into consideration of the limitations of the present thesis, and may examine the effectiveness of MAC approach to different age groups (from young to adults) and level (amateurs and elite athletes) in both genders, to use both subjective and objective measurements, and may include coach participation in the interventions.

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APPENDIX

Mindfulness Inventory for Sport (MIS)

Οι παρακάτω δηλώσεις περιγράφουν πράγματα που οι αθλητές μπορεί να βιώνουν κατά τη διάρκεια της αθλητικής προσπάθειας. Παρακαλώ απαντήστε σε τι βαθμό οι δηλώσεις αυτές ισχύουν για τις πρόσφατες αθλητικές σας εμπειρίες σύμφωνα με την παρακάτω κλίμακα.

1	2	3	4	5	6
Δεν ισχύουν καθόλου					Ισχύουν πάρα πολύ

Κατά τη διάρκεια της αθλητικής προσπάθειας/εκτέλεσης:						
1. Συνειδητοποιώ τις σκέψεις που περνάνε από το μυαλό μου	1	2	3	4	5	6
2. Καταλαβαίνω την ένταση στο σώμα μου όταν νιώθω νευρικότητα	1	2	3	4	5	6
3. Καταλαβαίνω στο σώμα μου την αίσθηση που προκαλεί ο ενθουσιασμός	1	2	3	4	5	6
4. Καταλαβαίνω στο σώμα μου τη δυσφορία όταν τη βιώνω	1	2	3	4	5	6
5. Δίνω προσοχή στα συναισθήματα που νιώθω	1	2	3	4	5	6
6. Όταν καταλαβαίνω ότι σκέφτομαι για προηγούμενες αποδόσεις μου, κριτικάρω τον εαυτό μου που δεν εστιάζω σε αυτό που πρέπει να κάνω τώρα	1	2	3	4	5	6
7. Όταν καταλαβαίνω ότι θυμώνω για ένα λάθος που έκανα, κριτικάρω τον εαυτό μου για αυτή την αντίδραση	1	2	3	4	5	6
8. Όταν καταλαβαίνω ότι δεν εστιάζω στη δική μου απόδοσή, κριτικάρω τον εαυτό μου που η προσοχή μου αποσπάται	1	2	3	4	5	6
9. Όταν καταλαβαίνω ότι σκέφτομαι το τελικό αποτέλεσμα, κριτικάρω τον εαυτό μου που δεν εστιάζω στο παιχνίδι μου	1	2	3	4	5	6
10. Όταν καταλαβαίνω ότι εκνευρίζομαι επειδή χάνουμε, κριτικάρω τον εαυτό μου για αυτή την αντίδραση	1	2	3	4	5	6
11. Όταν καταλαβαίνω ότι κάποιος μύες μου έχουν 'σφίξει' ή πονάνε, προσπαθώ άμεσα να τους χαλαρώσω	1	2	3	4	5	6
12. Όταν καταλαβαίνω ότι σκέφτομαι πόσο κουρασμένος είμαι, γρήγορα επαναφέρω την προσοχή μου σε αυτά που πρέπει να κάνω	1	2	3	4	5	6
13. Όταν καταλαβαίνω ότι ενθουσιάζομαι πολύ επειδή κερδίζουμε, εστιάζω την προσοχή μου σε αυτά που πρέπει να κάνω	1	2	3	4	5	6
14. Όταν καταλαβαίνω ότι έχω μεγάλη ένταση, μπορώ να επαναφέρω την προσοχή μου σε αυτά που πρέπει να κάνω	1	2	3	4	5	6
15. Όταν καταλαβαίνω ότι δεν εστιάζω στη δική μου απόδοση, μπορώ γρήγορα να συγκεντρώσω την προσοχή μου εκεί που πρέπει για να αποδώσω καλά	1	2	3	4	5	6

Organic Self-talk Questionnaire - Spontaneous Self-talk Scale (S-STs)

Αυτο-ομιλία είναι οτιδήποτε λένε οι αθλητές-τριες στον εαυτό τους κατά τη διάρκεια των προπονήσεων ή των αγώνων, σιωπηρά ή φωναχτά, και μπορεί να συμβαίνει αυθόρμητα ή με πρόθεση προκειμένου να ενισχύσουν την απόδοσή τους ή να επιτύχουν κάποιο στόχο τους.

Παρακάτω υπάρχει μια λίστα από διάφορες δηλώσεις που συνήθως οι αθλητές απευθύνουν στον εαυτό τους κατά την διάρκεια της **των προπονήσεων και των αγώνων**. Σας παρακαλώ να διαβάσετε κάθε δήλωση και να προσδιορίσετε **πόσο συχνά** είπατε την καθεμία στον εαυτό σας, **κατά τη διάρκεια των πρόσφατων προπονήσεων ή των αγώνων, με βάση την παρακάτω κλίμακα**.

0	1	2	3	4
Ποτέ	Σπάνια	Μερικές φορές	Συχνά	Πολύ συχνά

Υποδείξτε πόσο συχνά κατά τη διάρκεια των πρόσφατων προπονήσεων ή αγώνων, είχατε αυθόρμητες σκέψεις, δηλαδή σκέψεις που μας έρχονται στο μυαλό από μόνες τους, σαν τις παρακάτω:		Ποτέ	Σπάνια	Μερικές φορές	Συχνά	Πολύ συχνά
1.	Θα τα πάω καλά	0	1	2	3	4
2.	Θα αποτύχω	0	1	2	3	4
3.	Θα κερδίσω	0	1	2	3	4
4.	Θέλω να τα παρατήσω	0	1	2	3	4
5.	Μπορώ	0	1	2	3	4
6.	Θέλω να σταματήσω	0	1	2	3	4
7.	Σήμερα θα είναι η μέρα μου	0	1	2	3	4
8.	Δεν αντέχω άλλο	0	1	2	3	4
9.	Θα τα καταφέρω	0	1	2	3	4
10.	Τι θα νομίζουν/πουν οι άλλοι για την κακή μου απόδοση	0	1	2	3	4
11.	Τα πήγα καλά	0	1	2	3	4
12.	Πάλι λάθος έκανα	0	1	2	3	4
13.	Τα κατάφερα	0	1	2	3	4
14.	Απέτυχα	0	1	2	3	4
15.	Τέλεια	0	1	2	3	4
16.	Έπρεπε να είμαι καλύτερος	0	1	2	3	4
17.	Η προσπάθειά μου απέδωσε	0	1	2	3	4
18.	Τα πήγα χάλια σήμερα	0	1	2	3	4
19.	Έχω γίνει καλύτερος	0	1	2	3	4

20.	Είμαι άχρηστος	0	1	2	3	4
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Athlete's Subjective Performance Satisfaction Scale (ASPS)

Παρακαλούμε να βαθμολογήσετε κατά την δική σας κρίση/άποψη, την αθλητική σας απόδοση κατά τη διάρκεια των πρόσφατων προπονήσεων και αγώνων. Αξιολογήστε με βάση την κλίμακα από 1 έως 10, όπου 1= καθόλου ικανοποιημένος και 10= απόλυτα ικανοποιημένος.

1	2	3	4	5	6	7	8	9	10
Καθόλου ικανοποιημένος									Απόλυτα ικανοποιημένος

Σε γενικές γραμμές σε τί βαθμό είσαι ικανοποιημένος από την αθλητική σου απόδοση κατά τη διάρκεια των πρόσφατων προπονήσεων και αγώνων;									
1	2	3	4	5	6	7	8	9	10

Σε ποιο βαθμό θεωρείς πώς συνέβαλλες στην επιτυχία της ομάδας σου κατά τη διάρκεια των πρόσφατων προπονήσεων και αγώνων;									
1	2	3	4	5	6	7	8	9	10

Σε ποιο βαθμό θεωρείς ότι οι ικανότητές σου αντικατοπτρίστηκαν στην προσπάθειά σου κατά τη διάρκεια των πρόσφατων προπονήσεων και αγώνων;									
1	2	3	4	5	6	7	8	9	10

Σε ποιο βαθμό θεωρείς ότι συνέβαλλες στη βελτίωση της απόδοσης των συμπαικτών σου κατά τη διάρκεια των πρόσφατων προπονήσεων και αγώνων;									
1	2	3	4	5	6	7	8	9	10

Σε ποιο βαθμό θεωρείς ότι κατάφερες να ανταπεξέλθεις στις προκλήσεις/δυσκολίες κατά τη διάρκεια των πρόσφατων προπονήσεων και αγώνων;									
1	2	3	4	5	6	7	8	9	10

Σε ποιο βαθμό θεωρείς πώς ήταν ικανοποιημένος ο προπονητής σου από την απόδοσή σου κατά τη διάρκεια των πρόσφατων προπονήσεων και αγώνων;									
1	2	3	4	5	6	7	8	9	10

Mindfulness-Acceptance-Commitment (MAC) approach

Course Theme	Course Content	Practice
Psychoeducation	Theoretical Rationale of the Program & Connection with athletes' experience Automated Self-regulation	Brief Centering Exercise
Mindfulness & Cognitive Diffusion	Rationale and Importance of Mindfulness Discussion of the between sessions exercises Cognitive Fusion vs Cognitive Diffusion	Brief Centering Exercise + Washing a Dish Mindfulness Exercise
Values & Values Driven Behavior	Discussion of "what I have learned form" Clarify uncertainties Value-driven vs emotion-driven behavior	Breathing Mindfulness Exercise
Acceptance	Experiential Acceptance vs Avoidance Willingness & Commitment Importance	Breathing + Body Scan Mindfulness Exercise
Commitment	Review of sessions Values, Goals & Behaviors Connection	Brief Centering + Seeing Exercise
Skill Consolidation & Poise	Putting it all together: Enhancing Poise through exposure-based exercises	Breathing + Mindfulness Stretching Exercise
Maintaining & Enhancing Mindfulness, Acceptance, Commitment	Review of Sessions & Plan for Future Practice	Performance Relevant + Task Focused Attention Exercise