

Original Article

# The comparison Effectiveness of the Third Wave Behavioral Therapies on Behavioral Inhibition/Activation Systems of Anxious Football Player

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**Abstract:** One of the most important models of motivational approach and avoidance, in recent decades, is the model of behavioral activation system (BAS) and behavioral inhibition system (BIS) presented by Gray. The present study aimed at comparing the group metacognitive therapy (MCT) and group mindfulness acceptance and commitment therapy (MAC) on BAS and BIS of anxious professional football players in the U-19 league in Tehran. Participants in this study were 60 football players in professional football leagues in Tehran. These participants were entered into the assessment stage, and after obtaining informed consent, they were randomly assigned to one of the three experiment groups of MCT, MAC, and WL. The participants completed Jackson's revised 5-scale of rewarded sensitivity theory in pretest, posttest, and three months follow-up stages. The results of the present study demonstrate that MCT and MAC can make some changes in BAS and BIS among anxious football players. MCT has been more affecting on BIS than both other groups. According to these findings, it would ensure that football players affected by anxiety can take the opportunity to gain advantages from such third-wave interventions.

**Keywords:** Metacognitive Therapy; Acceptance based Behavior Therapy; Mindfulness Acceptance Commitment; BAS; BIS; Football Players;

## 1. Introduction

One of the most important models that deal with motivational-approach and avoidance tendencies in recent decades is the model of behavioral activation system (BAS) and behavioral inhibition system (BIS) proposed by Gray (Arjmand Ghujur & Eghbali, 2019; Sewart et al., 2019). In the original formulation of the reinforcement sensitivity theory, the BIS and the BAS have provided individual differences in the sensitivity of the two neuropsychological systems in their responses to environmental cues (AghaYousefi et al., 2018). Behavioral brain systems are new ways toward an individual's personality status by physiological characteristics and the neural processes of the central nervous system. The behavioral brain system is defined as a person's sensitivity to stimuli of reward or punishment, which is an interpretation of personality traits based on their genetic, physiological, and neuropsychological characteristics (Aghayusefi et al., 2015; Huh et al., 2020; Pickering, 2008).

Psychopathology of emotional disorders can be considered from different aspects. Emotions have biological and cognitive processes. One of the theories that deals with the psychological pathology of emotional disorders and disturbances from biological and natural perspectives focuses on two bio-appetitive systems (Asgharnezhad & Abdi, 2018; Choi et al., 2018; Ma-Kellams & Wu, 2020). According to Buck (1984), humans have two synchronous systems that activate and regulate emotions (Buck, 1984). Several physical and mental changes occur when persons fill emotions such as fear, anger, etc. These include shortness of breath, increased heart rate, dry throat, sweating, tremors, and feeling butterfly in the stomach. Most of these physiological changes, known as arousal, are the results of activation of the sympathetic part of the autonomic nervous system. There are also changes in the endocrine system, the hormones level, and glands. Other physical changes occur in the neural brain circuits, including the limbic brain structures, such as the amygdala. So, the rate of neural firing, or in other words, neural activity and the pace of the information processing change. Finally, the facial expressions change, which socially leads to the identification of each emotion. According to the reinforcement sensitivity theory, these systems are known as BAS/BIS (Carver & White, 1994; Corr, 2004; Gray, 1982). The BIS is an aversive motivational system that principally prevents behavior in response to potential threats. The BAS is an appetitive motivational system, which activates behavior in response to potential rewards (Lerner et

al., 2018). The BAS is structurally composed of several dopaminergic and cortico-striato-pallido-thalamic-cortical pathways in the brain. The neuroanatomy of this system includes the prefrontal cortex, amygdala, and basal ganglia (Hewig et al., 2006) and is activated by pleasurable stimuli associated with reward or elimination of punishment. The two behavioral components of this system include turning around (actively reward-seeking) and actively avoiding (punishment avoiding). The sensitivity of this system indicates individual impulsivity (Heponiemi et al., 2003). The BIS is the result of afferent, noradrenergic, and serotonergic pathways. The neuroanatomy of the behavioral punishment system is settled in the bilateral hippocampal system, brain stem, Papez circuit pathway, and prefrontal cortex. These structures increase arousal and levels of attention and negative emotions and overlap with the systems in which anxiety plays a role (Heponiemi et al., 2003). As a result, an active BIS is associated with feelings of anxiety, worry, and rumination (Knyazev & Slobodskoj-Plusnin, 2007). The Fight-Flight-Freeze System (FFFS) is also the third brain-behavioral system that is structurally related to the amygdala and hypothalamus (McNaughton & Corr, 2004). In contrast to annoying conditioned and unconditioned stimuli, it evokes avoidance, escape, and fear behaviors (Bijttebier et al., 2009; Tull & Gratz, 2008). The BAS responds to stimuli related to reward or elimination of punishment responses that lead to arousal and behavioral approach (Javanmard & Mirhasanpour Vahedi, 2017), while the BIS responds to conditional stimuli that are associated with punishment, aversion, or reward elimination and lead to behavioral arousal and avoidance (Ghanavati & Joharifard, 2019). The BAS is associated with many situations such as narcissism, hypomania, and hyperactivity (Dornbach-Bender et al., 2020; Leung et al., 2020).

Metacognition is how we think about what we think; Metacognition is a transdiagnostic process that is involved in several different emotional disorders. Metacognition includes knowledge of each cognitive process that involves cognitive assessment, monitoring, or control (Thorslund et al., 2020). The metacognitive model examines the role of metacognition of emotions such as depression, anxiety, and fear. According to this model, a trigger stimulus causes positive Meta-believes to be activated, and the person chooses to cope strategies against trigger stimulus or stressor event. This stage leads the person to become anxious; This is a healthy



worry and does not pose a problem because it leads one to believe that this worry is effective and keeps the person safe; this worry is also called the type 1 worry; anxiety develops when a person's negative thoughts about worry are activated; two kinds of negative thoughts about worry are uncontrollability and harmful or dangerous consequences. These negative thoughts cause the person to worry about their worries as well, which is called type 2 worry or meta-worry; these meta-worries interact with each other in behavioral, emotional, and cognitive forms (Wells, 2005, 2006a, 2006b, 2009). Metacognitive therapy (MCT) is based on the metacognitive model of cognitive biases of individuals. Based on the improvement of the cognitive attentional syndrome, the MCT modifies cognitive biases by improving the threat monitoring process. Positive metacognitive beliefs lead to the use of non-constructive behaviors such as rumination, repression, threat monitoring, and avoidance of negative thoughts. Similarly, negative metacognitive beliefs prevent a person from stopping rumination and lead to more involvement in empirical inhibitions because emotional experiences are considered a dangerous situation (Ruiz & Odriozola-González, 2015).

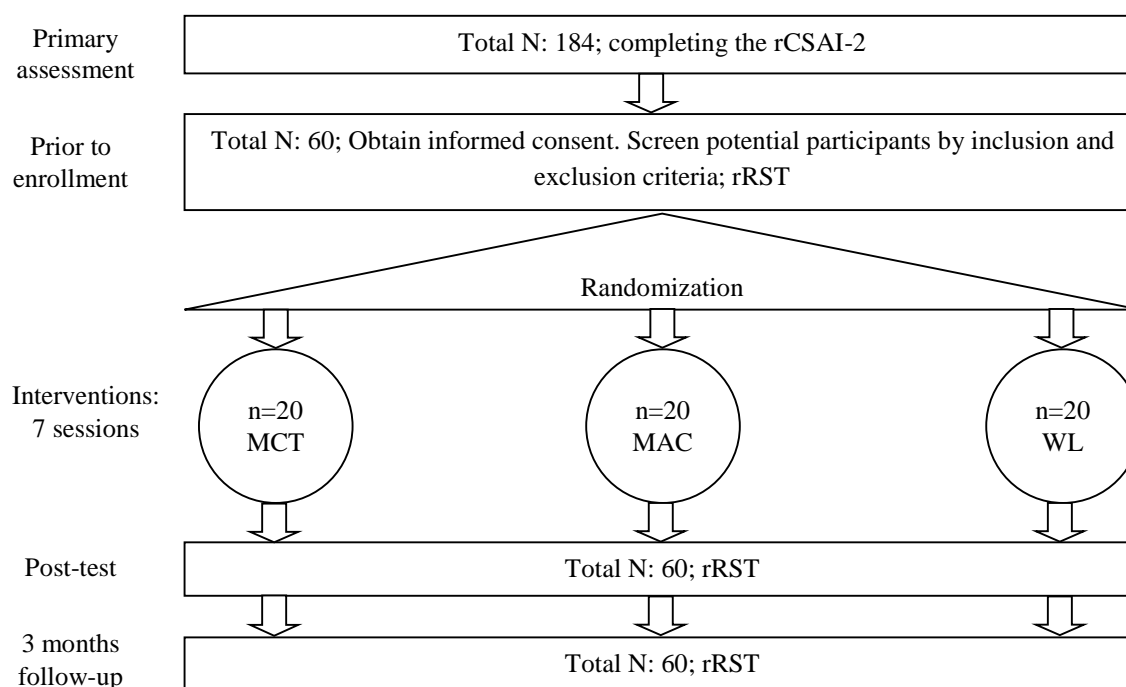
Acceptance and Commitment Therapy (ACT) (Hayes & Strosahl, 2004; Hayes et al., 1999) uses acceptance and mindfulness processes with the process of commitment and behavior change to create greater mental flexibility (Wersebe et al., 2018). ACT is effective as an intervention for a variety of clinical problems such as depression, feeding and eating disorders, generalized anxiety disorder, substance abuse and dependence, and borderline personality disorders (Roemer & Orsillo, 2009). These revolutionary theoretical developments and related interventions have not received much attention in the context of sports performance. In sports psychology, in particular, the mindfulness acceptance & commitment (MAC) approach developed by Gardner and Moore (Gardner & Moore, 2004, 2007, 2010, 2012, 2017), for performance enhancement is an acceptance-based intervention that aims to enhance high-level competitive performance and overall psychological well-being. Doğan (2016), in a case study at the University of Jyväskylä in Finland, reported that a program based on the MAC approach has been effective in understanding athletes' performance (Doğan, 2016). In Iran, many studies

reported that in two case studies on metacognitive (Alavizadeh, Sobhi Gharamaleki, et al., 2018) and MAC (Alavizadeh, Mami, et al., 2018) interventions were effective in reducing somatic and cognitive competitive anxiety, increasing self-confidence, and improving the aggression styles and attention index of goalkeepers and physiological symptoms (Alavizadeh et al., 2020). This study aimed to compare group intervention based on metacognitive therapy and MAC as an acceptance-based behavioral therapy (ABBT) on behavioral inhibition/activation systems among professional anxious football players in Tehran.

## 2. Methodology

This is a quasi-experimental study that includes a pretest, posttest, and follow-up design with a control group and a three-month follow-up stage. In this study, random assignment has been used for matched groups. The statistical population of the present study included professional football players with a high level of competitive anxiety who were occupied in professional football leagues in Tehran at 2017-18 years. The sampling method was judgmental sampling. Inclusion criteria include: being employed in one of the teams of U-23 Tehran Premier League, having a minimum degree of guidance school, getting a score higher than 15 and 12 in the cognitive and somatic anxiety subscales in the competitive state anxiety inventory-2 (CSAI-2), and exclusion criteria include being under concurrent psychiatric and psychological treatments and having a chronic mental disorder such as substance abuse or schizophrenia spectrum disorders; in this study, one session of absence was determined as the drop-out criterion. Initially, 184 people had a high score on competitive anxiety. Participants in this study entered to randomization phase after obtaining the informed consent, were randomly assigned to one of the two groups receiving the MCT and MAC or the waiting list control group. There were 20 people in each group; Randomization was done in a masked way by random numbers generator in Microsoft Office Excel. The number of sessions of both MCT and MAC was 7 (two sessions per week, four weeks in total), and each session lasted for 90 minutes. At the end of the course and in the posttest stage, they completed the questionnaires. Finally, after three months, the final stage assessments were performed.





**Figure 1.** Process of the study

## 2-1 Instruments

*Competitive State Anxiety Inventory-2:* This 27-item test, also known as the Illinois self-evaluation questionnaire, was developed by (Martens et al., 1990), which measures the somatic and cognitive components of state anxiety. The validity and reliability of this questionnaire have been confirmed in various studies (Sedarati, 2004). Martens et al. (1990) reported the internal consistency coefficient of Cronbach's alpha ranging from 0.79 to 0.91. In Iran, this coefficient is reported as 0.81 (Zamani & Moradi, 2009).

*Persian form of Jackson -5 Scales of Revised Reinforcement Sensitivity Theory:* This questionnaire has 30 items that Jackson has developed to better the measurement of the revised Reinforcement Sensitivity Theory (Jackson, 2009). This questionnaire includes five subscales of BIS, BAS, fight, flight, and freeze. For each of the subscales of the revised reinforcement sensitivity theory, six items are considered. Jackson used exploratory and confirmatory factor analysis to develop and test a new scale, the results have indicated the internal reliability and validity of the desired structure. Participants respond to items based on a

Likert scale of 5 options, with the number 1 indicating complete agreement (always) and the number 5 indicating strong opposition (never). In Iran, Cronbach's alpha ranged (0.72 to 0.88), and test-retest coefficient (0.64 to 0.78) were reported for the test components. Exploratory and confirmatory factor analysis also supported the 5-factor structure of the questionnaire (Hasani et al., 2012).

In this study, a clinical sports psychologist with ten years of clinical and sports experience was selected who participated in MCT and MAC courses. He was trained and supervised by prominent national and international experts.

## 2-2. Treatments

*MCT protocol:* The MCT protocol for Anxiety was the main source of intervention based on metacognitive therapy in the present study. This approach serves as a guide to the structure and content of sessions and can be flexibly modified according to individual and group circumstances (Wells, 2009). The table 1 summarizes the arrangement of these sessions.



**Table 1.** The structure of MCT protocol

S	Session Titles	Content of Sessions
1	Induction	Induction of metacognitive style
2	Control Challenge	Challenging metacognitive beliefs about the uncontrollability of anxiety and anger
3	Danger Challenge	Challenging metacognitive beliefs about the risk of anxiety and anger;
4	Challenge with Positive Metacognition	Challenging positive metacognitive beliefs about the risk of anxiety and anger
5	Reinforcement	Reinforcement of new programs for processing anxiety and anger;
6	Prevention	Relapse Prevention
7	Preparation	Familiarity with the metacognitive model and competitive anxiety, anger, sports aggression and violence

**MAC protocol:** The MAC protocol (Gardner & Moore, 2007) is a semi-structured program that uses many techniques to create acceptance of athletes' inner states so that they can focus on their current stimuli and tasks to achieve their meaningful values and goals (Doğan, 2016). This program usually lasts between 7 and 12 sessions (Schwanhauser, 2009). The protocol of the MAC method has been revised from a standard

8-session format to a flexible 7-session format to allow each module to be presented at any number of sessions required (Gardner & Moore, 2004, 2007, 2010, 2012). The MAC intervention protocol allows for increased effective performance and overall psychological well-being (Gardner & Moore, 2017). Table 2 illustrates the MAC protocol.

**Table 2.** The structure of MAC protocol

S	Session Titles	Content of Sessions
1	Preparation	Preparing the group with the methods and concepts of competitive anxiety, anger, sports aggression and violence
2	Mindfulness	Introduction of mindfulness and cognitive fault
3	Value	Introduction of values and behavioral guiding values
4	Acceptance	Introduction of acceptance
5	Commitment	Increase of Commitment
6	Balance	Reinforcement of balance and stability, combining mindfulness, acceptance and commitment
7	Maintain	Increase and maintain MAC

In this study, in addition to descriptive statistics, inferential statistics methods were used to analyze the data. Due to the type of research design, the repeated measurement method was used to analyze the data in the follow-up stage. Data were analyzed by SPSS-21 software.

### 3. Results

Table 3 shows the mean and standard deviation of demographic characteristics based on independent variables and initial comparison between experimental and control groups.

**Table 3.** Demographic characteristics of research participants

Variable	w-l	MCT	MAC	Total	$f/\chi^2$	p
Age	17.85 (0.81)	18.25 (0.75)	18.15 (0.74)	18.05 (0.77)	1.50	0.23
cognitive anxiety	23.50 (4.35)	23.45 (5.44)	21.85 (4.61)	22.93 (4.80)	0.76	0.47
somatic anxiety	16.15 (3.30)	17.60 (4.99)	17.50 (4.41)	17.08 (04.27)	0.72	0.49
playing post	-	-	-	-	0.49	0.79

As it can be seen in Table 3, in the pretest stage, there was no significant difference among all of the three groups in age ( $f = 1.50$ ,  $p = 0.23$ ), cognitive anxiety level ( $f = 0.76$ ,  $p = 0.47$ ), somatic anxiety ( $f = 0.72$ ,

$p = 0.49$ ) and playing post ( $\chi^2 = 0.49$ ,  $p = 0.79$ ). To implement each of the statistical methods, statistical preconditions are also required, which are summarized in table 4.



**Table 4.** Equality of variance test and comparison of pretest means of variables measured between experimental and control groups

variable	kurtosis	skewness	k-s	p	Box's M	F	P	Leven's test	P
BAS	0.22	-0.45	0.72	0.68	53.33	4.10	0.01	0.30	0.30
BIS	-0.38	-0.52	0.99	0.27	46.05	3.54	0.01	0.68	0.51

According to the results of Table 4, it can be seen that the data have a normal distribution, the pretest variances of the dependent variables between the experimental groups and the control group are not significantly different, and it means they are equal, so the preconditions for performing statistical analysis are established. The results of within-subject design

showed both MCT ( $f=5.12$ ,  $p=0.01$ ,  $\eta^2=0.15$ ) and MAC ( $f=5.12$ ,  $p=0.01$ ,  $\eta^2=0.15$ ) were effective interventions during pretest to follow-up stage.

Table 5 illustrates the mean, standard deviation, and results of the analysis of variance of BAS and BIS in the pretest and posttest stages, as well as repeated measurements in the 3-month follow-up stage.

**Table 5.** Results of ANOVA, and repeated measure of BAS/BIS in pretest and posttest and 3-month follow-up

								pairwise comparisons		
		W-L	MCT	MAC	f	p	$\eta^2$	MCT v MAC	MCT v W-L	MAC v W-L
BAS	Pre	16.10 (3.16)	16.45 (2.26)	15.85 (3.62)	0.19	0.83	-	0.83	0.94	0.97
	Post	16.05 (3.40)	13.20 (3.07)	11.95 (3.22)	-	-	-	-	-	-
	F-U	15.90 (3.81)	13.90 (2.36)	12.25 (3.32)	5.12	0.01	0.15	0.38	0.03	0.01
BIS	Pre	18.20 (3.35)	18.90 (4.02)	18.05 (3.38)	0.26	0.77	-	0.76	0.83	0.99
	Post	17.75 (3.31)	12.60 (3.44)	15.60 (3.02)	-	-	-	-	-	-
	F-U	17.70 (3.44)	12.85 (3.42)	15.25 (2.99)	5.50	0.01	0.16	0.28	0.01	0.21

The results of one-way analysis of variance between groups in the pretest stage in the components of BAS ( $f=0.19$ ,  $p=0.83$ ), and BIS ( $f=0.26$ ,  $p=0.77$ ) indicate that there are no significant differences between the studied groups as display in table 5. In addition, the results of repeated measures analysis of variance can be seen in the follow-up stage. Results in follow-up stage indicates there has been significant differences between the studied groups in the components of BAS ( $f=5.12$ ,  $p=0.01$ ,  $\eta^2=0.15$ ), BIS ( $f=5.50$ ,  $p=0.01$ ,  $\eta^2=0.16$ ). The results of Scheffe's pairwise comparison showed that there were no significant differences between MCT and MAC on BAS/BIS components in the follow-up stage. However, both treatments have been effective on BAS ( $p<0.05$ ) but there was no significant difference between MAC and the waiting list control group ( $p=0.21$ ).

#### 4. Discussion

This study aimed to compare group MCT and the MAC as an ABBT on BAS/BIS of professional football players in Tehran. The results indicated that these two interventions of the third wave of behavioral therapy can change professional football players. Based on these findings, it can be concluded that MCT

is more effective in improving behavioral systems than MAC therapy. This finding is supported by the research of (Alavizadeh et al., 2021; Amirian et al., 2017; Dixon et al., 2016; Entezari & Mojtabaei, 2014; Haji Seyed Javadi et al., 2020; Mojtabaei & Alavizadeh, 2017; Shareh, 2017; Strohmaier et al., 2021; Thorslund et al., 2020; Winter et al., 2019; Zettle, 2015) is coordinated; but it is completely different from the result of (Ghanavati & Joharifard, 2019).

The BIS plays an important role in the experience of negative emotions rather than positive emotions (Asgharnezhad & Abdi, 2018; Sewart et al., 2019); the relationship between BIS and lack of relationship with BAS with pathological and non-pathological anxiety is consistent with other theories and findings that show that BIS is associated with negative anxiety experiences, and it leads to anxious personality traits and hypervigilance or hypersensitivity to threats and feelings of anxiety. The use of the detached mindfulness technique is a possible explanation of this finding. The therapist trains the client to use detached mindfulness for any consequences of undesirable emotions such as fear and anger and their pathological consequences like anxiety and aggression. The next



step is to examine the existence of maladaptive coping strategies that are not beneficial to adaptation. Therapists and clients carefully evaluate the use of signal control strategies, minimizing threats, controlling thoughts, and reducing anxiety. Common maladaptive strategies include the use of alcohol and other drugs use or abuse, suppressing thoughts, avoiding or escaping from stressful event triggers, and over monitoring of the environment. Identifying these behaviors helps the person to identify problematic situations (Abdulpour, 2015).

In addition, the goal of MAC is to the improvement of the processes of acceptance, diffusion, self as a context, communication with the present, clarification of values, and participation in personal valuable activities that support psychological resilience. When a person gets stuck in the cycle of empirical-avoidance-cognitive-fusion, he or she experiences psychological inflexibility. Mental flexibility can free one from the trap of dysfunctional thoughts and behavioral activation. In acceptance and commitment therapy, the concept of cognitive fusion is the extent to which an idea influences behavior; context-dependent and thought-provoking behaviors are in a continuum between fusion and cognition, and when one gets involved with one's thoughts, one cannot distinguish one's mental judgment from reality. (Amiri, 2017; Amirian et al., 2017). Segal et al. believed that mindfulness is the essential component of raising self-awareness necessary for empowerment and optimal responses in critical situations and always acts as a strong permanent preventive stimulus (Segal et al., 2002). This approach can help free people from negative automatic thoughts, habits, and unhealthy behavioral patterns and therefore plays an important role in reducing stress and behavioral self-regulation. Interventions with mindfulness and acceptance components, with behavioral change and commitment strategies, help clients create a purposeful and meaningful life for themselves and let go of their avoidant and paradoxical behaviors. The MAC approach tries to increase behavioral inhibition and decrease behavioral activation by creating psychological flexibility and encouraging the individual to act on individual values. The goal of MAC is to help people create meaningful and prosperous life. These techniques reduce negative thoughts by increasing self-awareness of present experiences and turning our attention to the cognitive system and more efficient information processing. Some previous findings indicate an increase in the sensitivity of the BIS and psychological distress, is

negatively associated with the components of acceptance and the four principles of mindfulness, including description, awareness action, non-judgment, and inactivity (Evans et al., 2008; Hamill et al., 2015). Additionally, the aspects of acceptance and mindfulness are expected to moderate the relationship between the sensitivity of the BIS and psychological distress; therefore, a low acceptance rate affects increasing the sensitivity of the BIS and emotional and anxiety symptoms.

An unexpected finding was that in the MAC treatment group, there was no significant difference with the waiting list control group in reducing sensitivity to BIS. People are expected to control their anxiety by accepting worry; acceptance may lead to a cognitive and emotional distance from negative emotions by adopting a non-judgmental perspective, thereby reducing the hypersensitivity of the BIS; But based on the findings of this study, which shows that mindfulness and acceptance in thoughts and feelings may cause problematic emotional reactions when we experience high levels of emotion (Hamill et al., 2015). Acceptance may increase negative emotions and symptoms of severe depression or anxiety. On the one hand, the findings confirm that acceptance can reduce rumination (Liverant et al., 2011), and on the other hand, rumination is associated with empirical avoidance, which is conceptually the opposite of acceptance, and by the focus on undesirable emotions and prevention of stressful events leads to complex emotional distress. Cribb et al. (Cribb et al., 2006), reported that rumination is associated with high sensitivity of the BIS. Decreased Acceptance According to Liverant et al. (Liverant et al., 2011), unregulated sensitivity of the BIS may increase emotional symptoms by assessing a negative situation or emotion as threatening or overly negative, while MCT considers the individual challenges on positive and negative worries and coping strategies that one can deal with these issues better. Past researches had suggested that worrying about negative emotions without effective coping strategies may increase the feeling aspects of emotion (Lam et al., 2003). Increasing the use of acceptance-based strategies may act as a healthy alternative to rumination. Unlike rumination, acceptance may lead to a cognitive and emotional distance from negative feelings by producing a non-judgmental perspective; thus, acceptance reinforces the observed effect of the increased sensitivity of the BIS on the emotional symptoms. Besides, previous research has shown that increasing the sensitivity of the BIS to a reluctance to



experience negative emotions can play a role in increasing anxiety responses (Pickett et al., 2012). Some studies have shown a positive relationship between mindfulness and anxiety symptoms reduction (Luberto et al., 2011). Also, mindfulness-based actions like detached mindfulness technique may inadvertently negatively affect emotional regulation; even a relatively small amount of mindfulness practice can be beneficial and shorter practices may initially be more helpful for novice practitioners (Strohmaier et al., 2021). Because mindfulness pays attention to both internal and external stimuli, this careful and instantaneous attention can lead to hypervigilance. Hypervigilance in return can lead to increased rumination and worry and eventually anxiety. These findings suggest that after MCT and MAC, the mental state of anxious individuals is not easily engaged to spontaneous emotion fluctuations under an intrinsic resting state. In short, the acceptance technique does not diminish the emotions but mindfulness techniques shift attention away from emotion perception in people with negative emotions (Huang et al., 2021). Based on these concepts, it provides a basis for interpreting current findings as to why the MAC approach has not been statistically different from the control group in reducing the sensitivity of the BIS.

Because this study has been performed in athletes with high anxiety, it is suggested that in future outcome studies, researchers compare the effect of these two interventions, and in future processes research, they compare the MAC approach without acceptance and mindfulness techniques on BIS and BAS among athletes' groups with different levels of anxiety.

## 5. Conclusion

According to these findings, it would ensure that football players affected by anxiety can get the opportunity to gain advantages from such third-wave interventions.

**Conflict of Interest:** The authors declare that they have no conflict of interests.

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**Ethical Statement:** Ethics were carefully observed in this research, and the informed consent of the participants was obtained. Informed consent included information on intervention methods, sampling

method, random assignment, number and duration of sessions, confidentiality, the privacy of participants, knowledge of the outcome of treatment and the right to withdraw from the study at any time they wish; and their written informed consent to participate in the research was obtained.

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## مقایسه اثربخشی درمان‌های رفتاری موج سوم بر سیستم‌های بازداری/فعال‌سازی رفتاری فوتبالیست‌های مضطرب

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**چکیده:** یکی از مهم‌ترین مدل‌های رویکرد انگیزشی و اجتنابی در دهه‌های اخیر، مدل سیستم فعال‌سازی رفتاری و سیستم بازداری رفتاری است که توسط گری ارائه شده است. مطالعه حاضر با هدف مقایسه درمان فراشناختی گروهی و درمان ذهن‌آگاهی مبتنی بر پذیرش و تعهد گروهی بر سیستم فعال‌سازی رفتاری و سیستم بازداری رفتاری بازیکنان حرفه‌ای فوتبال مضطرب لیگ زیر ۱۹ سال تهران انجام شد. شرکت‌کنندگان در این مطالعه ۶۰ بازیکن فوتبال در لیگ‌های حرفه‌ای فوتبال شهر تهران بودند. این شرکت‌کنندگان وارد مرحله ارزیابی شدند و پس از کسب رضایت آگاهانه، به صورت تصادفی در یکی از دو گروه آزمایشی درمان فراشناختی و درمان ذهن‌آگاهی مبتنی بر پذیرش تعهد، یا گروه گواه قرار گرفتند. شرکت‌کنندگان ۵ مقیاس تجدید نظر شده نظریه حساسیت پاداشی جکسون را در مراحل پیش آزمون، پس آزمون و سه ماه پیگیری تکمیل کردند. نتایج مطالعه حاضر نشان می‌دهد که درمان فراشناختی و درمان ذهن‌آگاهی مبتنی بر پذیرش تعهد می‌توانند تغییراتی در سیستم فعال‌سازی رفتاری و سیستم بازداری رفتاری در بین بازیکنان مضطرب فوتبال ایجاد کنند. درمان فراشناختی بیش از هر دو گروه دیگر بر سیستم بازداری رفتاری تأثیر گذاشته است. با توجه به این یافته‌ها، اطمینان حاصل می‌شود که بازیکنان فوتبال متاثر از اضطراب می‌توانند از چنین مداخله‌های موج سوم بهره‌مند شوند.

**واژه‌های کلیدی:** درمان فراشناختی؛ رفتار درمانی مبتنی بر پذیرش؛ ذهن‌آگاهی مبتنی بر تعهد و پذیرش؛ سیستم فعال‌سازی رفتاری و سیستم بازداری رفتاری؛ فوتبال؛

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این نماد به معنای مجوز استفاده از اثر با دو شرط است یکی استناد به نویسنده و دیگری استفاده برای مقاصد غیرتجاری.