MINDFULL COMPASSION TRAINING ON ELITE SOCCER: EFFECTS, ROLES AND ASSOCIATIONS ON FLOW, PSYCHOLOGICAL DISTRESS AND THOUGHT SUPPRESSION

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ABSTRACT: Research on mindfulness and self-compassion has suggested that these closely related constructs are also strongly related to flow, psychological distress, experiential avoidance and thought suppression. Despite the potential of this approach, literature in respect to the relation and role of these constructs in the sport context is scarce, particularly in soccer.

The current study explored relations among self-compassion, mindfulness, psychological flexibility, and psychological distress (including anxiety), thought suppression and flow state, through the implementation of Mindfulness-Based Soccer Program (MBPSoccerP) for elite athletes. This study also analyzed the influence of baseline psychological flexibility, self-compassion and mindfulness facets on psychological distress, anxiety, flow and thought suppression measures at post-intervention.

Methods: A quasi-experimental design was used and involved a pre-/post-pilot study and paired t-tests, pearsons correlations and hieraquical regression analyses were conducted to determine the common and unique variance in sport context predicted by these constructs and to compare their relative predictive strength in a nonclinical sample of elite soccer players -Portuguese 2º league (n=57; M_{age} = 25.79 years, SD = 3.3)

Results: Findings showed self-compassion, mindfulness and psychological flexibility were negative associated with psychological distress (including anxiety) and thought suppression; and positively related to flow. In support, self-compassion, mindfulness and experiential avoidance explained variance beyond psychological distress (including anxiety), thought suppression and flow.

Conclusions: Results suggest that mindfulness, self-compassion and psychological flexibility development may be beneficial in cultivating positive sport experience and flow state and less psychological distress and thought suppression.

KEYWORDS: Mindfulness, Compassion, Distress, Psychological flexibility, Thought suppression

EL ENTRENAMIENTO MINDFULNESS E COMPASIÓN EN EL FÚTBOL PROFESIONAL: EFECTOS, PAPELES Y ASOCIACIONES EN EL FLOW, SÍNTOMAS PSICOLÓGICOS Y SUPRESIÓN DE PENSAMIENTO

RESUMEN: La investigación sobre la atención plena y la autocompasión ha sugerido una relación con el flow, la angustia psicológica, la evitación experiencial y la supresión. A pesar del potencial de este enfoque, existe una escasez de literatura con respecto a la relación y el papel de estos constructos en el contexto deportivo, y específicamente en el fútbol.

El estudio actual exploró las relaciones entre la autocompasión, la atención plena, la flexibilidad psicológica y la angustia psicológica (incluida la ansiedad), la supresión del pensamiento y el flow, a través de la implementación del entrenamiento de Atención plena, compasión, e flexibilidad psicológica (MBPSoccerP) para los atletas de fútbol de élite. También se estudió la influencia de las facetas de flexibilidad psicológica, autocompasión y atención plena en las medidas de angustia psicológica, ansiedad, flow y supresión del pensamiento.

Métodos: El diseño cuasi-experimental fue un estudio previo / posterior y se realizaron pruebas t pareadas, correlaciones de pearsons y análisis de regresión hieraquica para determinar la varianza única y común en el contexto deportivo predicha por estas construcciones y comparar su predicción relativa en una muestra no clínica de jugadores de fútbol -Portugueses 2º league (n = 57; M = 25.79 años, SD = 3.3)

Resultados: la autocompasión, la atención plena y la flexibilidad psicológica fueron negativamente asociadas con la angustia psicológica (incluida la ansiedad) y la supresión del pensamiento; y positivamente relacionado con el flow.

Conclusiones: Los resultados sugieren que el desarrollo de la atención plena, la autocompasión y la flexibilidad psicológica pueden ser beneficiosos para cultivar la experiencia deportiva positiva y el estado de flow y disminuir la angustia psicológica y la supresión del pensamiento.

PALABRAS CLAVE: Atención plena, Compasión, Angustia psicológica, Flexibilidad psicológica, Supresión.

O TREINO MINDFULNESS E COMPAIXÃO NO FUTEBOL PROFISSIONAL: EFEITOS, PAPÉIS E ASSOCIAÇÕES NO FLOW, SINTOMAS PSICOLÓGICOS E SUPRESSÃO DE PENSAMENTO

RESUMO: A investigação sobre mindfulness e autocompaixão sugere uma relação com o estado de flow, distress psicológico, evitamento experiencial e supressão de pensamento. Apesar do potencial destas abordagens, há uma escassez de literatura sobre a relação e o papel destes construtos no contexto desportivo e, especificamente, no futebol profissioal.

O presente estudo explorou as relações entre autocompaixão, mindfulness, flexibilidade psicológica e distress psicológico (incluindo a ansiedade), supressão de pensamento e flow, através da implementação de treino mental focado no mindfulness, compaixão, e flexibilidade psicológica (MBPSoccerP) em atletas de futebol. Estudamos também a influência das facetas mindfulness, da flexibilidade psicológica, autocompaixão nas medidas de sofrimento psicológico, ansiedade, flow e supressão do pensamento.

Métodos: Num design quase experimental efectuou-se um estudo pré / pós teste, analisado com a estatistica testes t emparelhados, correlações de Pearson e análise de regressão, realizadas numa amostra não clínica de jogadores de futebol - 2ª liga portuguesa (n = 57; M = 25,79 anos, DP = 3,3)

Resultados: A autocompaixão, mindfulness e flexibilidade psicológica foram negativamente associados com

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sofrimento psicológico (incluindo ansiedade) e supressão do pensamento; e positivamente relacionados com o flow.

Conclusões: Os resultados sugerem que a prática de mindfulness, da autocompaixão e da flexibilidade psicológica podem ser benéficos para cultivar uma experiência desportiva positiva e aumentar o flow, e diminuir o sofrimento psicológico e a supressão do pensamento.

PALAVRAS CHAVE: Mindfulness, Compaixão, Distress, Flexibilidade psicológica, Supressão

Cognitive behavioural methods have been widely used to aid athletes reach their best performances (Birrer & Morgan, 2010). Self-regulation is the umbrella term for such methods and it consists of techniques like arousal control, goal setting, imagery, self-talk, pre-competitive routines, and mental rehearsal (Carraça, Serpa, Palmi, & Rosado, 2018; Gardner & Moore, 2012).

Hence, a new approach has emerged in the sport context - mindfulness, compassion and acceptance commitment approaches (Carraça, Serpa, Rosado, & Palmi, 2018a, 2018b, Kabat-Zinn, 2003; Neff & Germer, 2013; Tirch, 2010). Enhanced mindfulness, through mindful-compassion and acceptance based interventions like mindfulness-based soccer program (MBSoccerP), has been found to reduce many symptoms associated with anxiety (Baer, 2003; Carraça, Serpa, Palmi, & Magalhães, 2015; Keng, Smoski, & Robins, 2011, Neff & Germer, 2013) and mindfulness and compassion meditation training has been associated with the ability to let go of and decreased occurrence of negative thoughts (Frewen, Evans, Maraj, Dozois, & Partridge, 2008, Neff & Germer, 2013).

Mindfulness is defined as an experience of awareness and purposeful attention to one´s present-moment experiences, in a non-judgmental and accepting way (Kabat-Zinn, 2003) and may create a basis for the experience of flow (Aherne, Moran, & Lonsdale, 2011; Kaufman, Glass, & Arnkoff, 2009). Some evidence for the causal role of mindfulness in the mindfulness-flow relationship comes from research with athletes and suggest that mindfulness interventions may increase flow experience (Aherne, et al., 2011; Kaufman, et al., 2009) and in studies not directly related to sports, such interventions have benefits ranging from reductions in anxiety and depression (Holzel, et al., 2011; Kabat-Zinn, 2003; Khusid & Vythilingam, 2016).

On other hand, self-compassion represents an empathic, equanimical view of one's own faults as part of the universal human experience (Neff & Germer, 2013; Tirch, 2010).

The one´s that explored self-compassion in sport context have found that self-compassion is positively related to psychological flexibility and performance (Carraça, et al., 2015; Carraça, et al., 2018a; Hollis-Walker & Colosimo, 2011; Neff, et al., 2007). A foundation for this endeavour is set by the current study, which focuses on the link between self-compassion and psychological distress, anxiety, flow and thought suppression, which to our knowledge, has not been explored in this population.

Psychological inflexibility denotes an emphasis on managing psychological reactions over performing actions consistent with deeply held values, often in an attempt to avoid unpleasant emotions (Bond, et al., 2011; Gardner, 2016).

In addition, meta-analytic research on integrated mindfulness, self-compassion and acceptance and commitment (ACT) models has suggested that these closely related constructs are also strongly and negative related with psychological distress and experiential avoidance/psychological inflexibility (Gardner, 2016; MacBeth & Gumley 2012; Moore & Gardner, 2014; Mosewich, Crocker, Kowalski, & DeLongis, 2013).

Intervention research also suggests that self-compassion commonly increases and accompanies improvement in positive and negative symptoms during MBIs (Ortner, et al. 2007; Orzech, et al. 2009; Shapiro, Carlson, & Freedman, 2006), and may even mediate symptom improvement (Kuyken, et al., 2010). Despite this potential, few studies have examined or explored self-compassion as a potential resource for sport context and athletes, specifically in soccer (Carraça, Serpa, Rosado, & Palmi, 2018a, 2018b). The MBSoccerP seems to have impact in increasing the attributes of mindfulness, compassion, psychological flexibility, and in which terms that mediates dispositional flow and peak performance on elite soccer players. This program seems to work as a stress and suppression thoughts buffer (Carraça, Serpa, Rosado, & Palmi, 2019).

Hence, the current study explored relations among self-compassion, mindfulness, psychological flexibility, and psychological distress (including anxiety), thought suppression and flow state, through the implementation of Mindfulness-Based Soccer Program (MBPSoccerP) for elite athletes.

Further, the current study hypothesized that self-compassion, mindfulness and psychological flexibility would relate negatively to thought suppression, psychological distress (including anxiety), and positively to flow. Separate hierarchical regressions analyses were used to test that self-compassion, mindfulness and or psychological flexibility is expected to explain significant unique variance beyond, dispositional flow, psychological distress (including anxiety) and thought suppression.

METHODS

Sample

This was a quasi-experimental design, participants were 57 elite male soccer players of Portuguese professional 2nd league, twenty-eight were in the MBSoccerP intervention condition and twenty-nine were in the wait-list control condition, between 18 and 30 years of age (Mage= 25.68 years; SD=3.42 years, MBSoccerP group; Mage= 25.90 years; SD=3.18 years, control group). The groups did not significantly differ with regard to age, gender, years of practice, Nationality (Portugal, n= 44; Brazil, n= 9; Serbia, n= 1; Guinea-Bissau, n= 2; Ivory Coast, n= 1) and hours of soccer training per week (14h per week).

The participants were selected based on the following criteria: (a) were actively competing at an elite club level; (b) had Portuguese language proficiency; (c) and were 18 years or older (i.e., taking into account the evaluation protocol and the intervention program were designed for adult athletes). The exclusion criteria were (a) having mental health disorders and/or consumption of psychiatric drugs, (b) significant previous experience with mindfulness programs and (c) being younger than 18 years.

Instruments

Participants completed the following measures at baseline and post-test:-

General demographic information sheet. These data were collected (e.g. age, gender, Nationality, and spoken/written languages), as well as sport-specific information (such as, level of sport participation, years of sport participation, hours of week training) was collected during the study.

Self-Compassion (Neff, 2003, Gouveia & Castilho, 2006). Self-compassion scale-SCS that consists of six sub-scales. Three represent the components of self-compassion (self-kindness, common humanity, mindfulness, and the other three are constructs in opposition to the three components of self-compassion, specifically Self-Judgment, Isolation and Over-Identification). Responses are made on a 5-point scale ranging from 1 *(almost never)* to 5 *(almost always).* The scale has been found to be reliable for use in this study (α = .83).

Five Facet Mindfulness Questionnaires - FFMQ (Baer, et al., 2006; Gregório & Gouveia, 2011). The questionnaire is an instrument that was based on five factors that include observing, describing, acting with awareness, non-judging of inner experience, and non-reactivity to inner experience. Responses are coded according to a 5-point likert scale from (1) never or very rarely true to (5) very often or always true. The scale has been found to be reliable for use in this study (α = .84).

Flow State Scale-DFS - 2 (Jackson & Eklund, 2004; Gouveia, 2011). The measure has nine scales that represent Csikszentmihalyi's (1990) 29 dimensions of flow. The dimensions measured include challenge-skill balance, action-awareness merging, clear goals, unambiguous feedback, concentration of task at hand, sense of control, loss of self-consciousness, transformation of time, and autotelic experience. Responses range on a 5-point likert scale from (1) strongly disagree to (5) strongly agree. The scale has been found to be reliable for use in this study (α = .95).

Brief Symptom Inventory - BSI (Derogatis, 1982; Canavarro, 1999). It is a 53-item self-report symptom inventory designed to reflect the psychological symptom patterns. Each item of the BSI is rated on a five-point scale of distress (0-4), ranging from "not at all" (0) at one pole to "extremely" (4) at the other. The depression and anxiety sub-scales of the Brief Symptom Inventory (BSI) are well established. The scale has also been found to be reliable for use in this study (α = .96).

Acceptance & Action Questionnaire – AAQ II (Bond et al., 2011, Gouveia et al., 2012). The 7-item Portuguese version of the AAQ- II has responses ranging on a 7- point likert scale from (1) never true to (7) always true. This scale reflects the single domain of psychological inflexibility. In this study we obtained (α = .77).

White Bear Suppression Inventory-WBSI (WBSI; Wegner & Zanakos, 1994; Gouveia, & Albuquerque, 2007). Is a 15-item questionnaire that is designed to measure thought suppression. Chronic thoughts suppression is a variable that is related to obsessive thinking and negative affect associated with depression and anxiety. The scoring of the WBSI is based on a 5 point scale from Strongly disagree (1) to Strongly agree (5). The scale has also been found to be reliable for use in this study (α = .78).

Procedure

Once ethical clearance was attained from Ethics Committee of the Faculty of Human Kinetics, the MBSoccerP sample were assessed at pre-intervention (time 1), post-intervention (time 2), and were randomly assigned to MBSoccerP intervention. To gain access to the players, we contacted soccer coaches and clubs, and arranged a time and place for a first meeting to explain the MBSoccerP and the study's purposes. All participants were informed about the study design and ethical standards, and signed an informed consent. , Athletes then completed the pre-intervention questionnaires anonymously at a convenient time. Following completion of the questionnaires, the intervention group started the MBSoccerP eight-week program (9 sessions, 90 to 120 minutes each session, plus 2 sessions of pre to post evaluation program and qualitative contents evaluation by the coach and athletes).

At the end of the eight-week period, all participants were asked to complete the post-test survey and the in the last session the participants in the intervention group were asked to complete a brief written overall evaluation of the program where they answered open-ended questions about if and how they perceived that the program had enhanced how they soccer and their relationship with the coach and teammates. The athletes in the control were offered the MBSoccerP intervention after the study was completed.

In addition, in their weekly workbooks participants' were asked to complete a record of minutes meditated immediately after each home-meditation session. Compliance was measured by noting class attendance and assessing the frequency and duration of formal mindfulness and compassion practice (i.e., body scan, compassionate self), and the frequency of informal mindfulness practice (i.e., breath awareness and daily life mindfulness).

MBSoccerP protocol

The *MBSoccerP* is a structured skills training program for elite soccer athletes which was developed by the first author at the University of Lisbon. The author has training in mindfulness-based interventions (MAC, MBSR, MBSoccerP, MBCT, MCT) Compassion Focused Therapy (CFT) and Acceptance and Commitment Therapy (ACT) delivered the program since 2006.

The program has been developed from mindfulness stress reduction program (MBSR, Kabat-Zinn, 2003), acceptance and commitment program (MAC, Gardner, & Moore, 20129 and compassion mind training (MCT, Neff, & Germer, 2013). The program skill based curriculum allows for adaptation and flexibility in working with athletes but not changing the main components of the program to assure the fidelity of the intervention. The participants of the MBSoccerP intervention group met, in their group, once weekly for 90/120 minutes, during 8 weeks. It is important that adequate time be given to allow for adequate skill practice to allow the brain to adapt, make new pathways, and change and make the new behaviours permeant.

The program addresses the following topics with multiple skill-based lessons and practical sessions: Introduction to MBSoccerP Mindfulness and sports; Mindfulness of the Body and mind- self-talk; Mindfulness and Goal Setting versus Process Goals, Building a Mindfulness Practice –*Thoughts*; Emotions and Meaning in Sports Life- Radical Acceptance; Mindfulness and imagery; Silent Mindful Walking/Running and Self Compassion; Mindfulness Acceptance and Compassion-Body Connection & Athletes Recovery, and Ending MBSoccerP. All sessions follow a sequence: review previous session, homework and overall MBSoccerP; centering exercise; short introduction to the topic of the present session and practice of experiential mindfulness exercises or other 3º CBT wave sport psychological technique (session task focused exercise); yoga/ relaxation for beginner's; plan for future practice; homework prescription; mindful-compassion meditation. Also role plays, fill worksheets exercises and short talks and group discussion regarding their own reflections and experiences that were related to session´s topic. At the end of each session, the participants were given a homework assignment that was given presently or sent electronically to each player´s e-mail address.

Some lessons/sessions details are described below in table 1, for example *Mindful Walking and Mindful Breathing* are meditations that involve focusing on a specific action or experience of the body in the present moment. The STOP exercises connect emotions and thoughts to the body when experiencing stress; Body Scan involves concentration on specific areas of the body; and Self Compassion Letters and Loving Kindness is a meditation on positive wishes and intention for one's self. Each session also contained a meditation to complete throughout the week and self-guided readings. Additionally, worksheets and email audio applications were introduced to participants could track their mindful compassion training, performance and complete corresponding meditations between each session.

Data analysis

The data were screened to test the assumption of normality and homoscedasticity of multiple regression and Pearson test. The internal consistencies of the instruments were evaluated by Cronbach´s alpha. The statistical analyses were completed using SPSS- version 24.0. (Marôco, 2018).

Pearson product-moment correlations were used to test Hypothesis 1, that self-compassion, mindfulness and psychological flexibility would relate negatively to thoughts suppression, psychological distress (including anxiety), and positively to flow. Separate hierarchical regressions analyses were used to test Hypothesis 2 - that self-compassion, mindfulness and/or psychological flexibility is expected to explain significant unique variance beyond, dispositional flow, psychological distress (including anxiety) and thought suppression (Field, 2009).

RESULTS

As expected, mindfulness, self-compassion, flow increased from pre-to post-intervention and experiential avoidance/psychological inflexibility (AAQ-II), BSI-IGS and BSI-anxiety and thought suppression (WBSI) decreased. Hedges g, an effect size estimate recommended for use with small samples, were calculated (see table 2). Correlations between all measures at pre and post-intervention were measured and are presented in table 3.

Consistent with hypothesis 1, we found a positive, moderate to high, and significant relation between AAQ- II total and DFS total (r = .32, p<.05) ; SCS total (r = .42, p<.01); FFMQ awareness (r = .31, p<.05); FFMQ no react (r = .39, p<.01); WBSI (r = .49, p<.01); BSI-IGS (r = .47, p<.01); BSI-anxiety (r = .33, p<.05). Also between DFS total results indicated that correlations were positive, weak to moderate, and significant with SCS total (r = .38, p<.01) and negative with BSI-IGS (r = -.29, p<.05).

SCS total results indicated that correlations were positive, weak and significant with FFMQ describe (r = .34, p<.05); BSI-IGS (r = .47, p<.05); and negative with WBSI (r = -.38, p<.01).

SCS dimensions results indicated that correlations were positive, moderate to high and significant between SCS self-isolation with SCS total (r = .30, p<.05); SCS self-judgment r = .26, p<.05); SCS mindfulness with DFS (r = .31, p<.05); SCS total r = .34, p<.01); SCS Isolation r = .34, p<.01); SCS self-judgment (r = .28, p<.05); SCS self-judgment with BSI-IGS (r = .40, p<.05); WBSI (r = -.31, p<.05); between SCS Over identification with SCS total (r = .54, p<.01); SCS isolation (r = .32, p<.05); SCS mindfulness (r = .37, p<.01); SCS self-judgment (r = .39, p<.01); Between SCS self-kindness with SCS mindfulness (r = .53, p<.01).

There were negative correlations between SCS self-isolation with BSI-IGS (r = -.31, p<.05); SCS mindfulness with BSI-IGS r = -.31, p<.05); and SCS self-judgment with WBSI (r = -.46, p<.01); BSI-IGS (r = -.47, p<.01); BSI anxiety (r = -.35, p<.01).

WBSI total results indicated that correlations were positive, weak to moderate and significant with AAQ-II (r = .44, p<.05); BSI –IGS (r = .42, p<.05) and negative between WBSI with SCS Isolation (r = -.31, p<.05).

The findings showed positive correlations, moderate and significant between BSI-IGS and AAQ-II (r = .39, p<.05); SCS (r = .38, p<.01); SCS isolation (r = .44, p<.01), WBSI (r = .47, p<.01). BSI- anxiety (r = .56, p<.01). Also correlations positive and significant between BSI-anxiety and AAQ-II (r = .32, p<.05) and BSI –IGS (r = .66, p<.01); and negative with SCS (r = -.28, p<.01); SCS isolation (r = -.39, p<.01); SCS mindfulness (r = -.31, p<.01); SCS over identification (r = -.29, p<.05) and WBSI (r = -.42, p<.01).

Next, hierarchical regression was used to assess the influence of baseline experiential avoidance/psychological inflexibility (AAQ-II), self-compassion, mindfulness facets on flow, though suppression, BSI-IGS and BSI –anxiety at post-intervention. Results indicate that baseline experiential avoidance/ psychological inflexibility predicted lower increase on dispositional flow at post intervention (see table 4) while controlling for baseline AAQ-II. Also baseline Mindfulness facet FFMQ- non-judgment predicted lower thought suppression (WBSI) at post intervention while controlling for baseline FFMQ- non-judgment (table 4). Also Mindfulness facet FFMQ- non judgment and SCS total predicted lower BSI-IGS traits at post intervention while controlling for baseline FFMQ non-judgment and SCS total (table 4). Also SCS-over identification predicted higher BSI-anxiety at post intervention while controlling for baseline SCS OVER (table 4).

Table 1. Mindfulness-Based Soccer Training Structure (MBSoccerP).

Sessions	Key concepts/Learning Goals	Experiential and Psycho-educational Training	After-Session Assignment
1- Introduction to MBSoccerP Mindfulness and sports	-Definition of Mindfulness; -Definition of Flow -Stress: Responding *vs*. Reacting to Stimulus; -Awareness the best mental tool; - Attention; - The mindful athlete	-3 Minutes meditation - Mindful breathing - Mindful eating	- Breath Meditation - STOP technique - Check in to informal and formal practice - Selected pre, match and post-match worksheets - Simple Awareness and/or Mindful Eating
2 - Mindfulness of the Body and mind- self-talk	- Body as a anchor to present/conduit for experience; - Pleasant & Unpleasant *vs*. mindfulness and positive & negative thinking experiences; - Automatic pilot and sport mechanics	- Body Scan - Raisin exercise - The mindfulness solution: Aware, Accept and Action mindfulness and self-talk: red thoughts means stop; yellow is neutral and green is go ("I can do it"); - Metaphor feed the tiger/unwelcome party guest	- Body Scan -Selected Readings/worksheets Remember and repeat: Aware, Accept and Action -Body Scan, Sitting Meditation. - Pleasant Events Calendar
3 - Mindfulness and Goal Setting versus Process Goals	- How mind hold the body back; -Goals and Values; - Performance values	-Process goals exercise- ARMS: Action oriented, Realistic, measurable; sequential Performance values and value-driven behavior: Mind is not your friend, and thanks your mind, the voice in my head. Mindful yoga Smart Goals: Soothing-Supportive; Specific; Meaningful; accountable/attach/ Associate; resources; Time. - Introducing mindful yoga for beginners	- Kindness Meditation - Meditation on Smart Phone App/ email audio exercise -Selected Readings/Worksheets /diffusion rate form Mindful Yoga, Body Scan - Unpleasant Events Calendar
4 - Building a Mindfulness Practice and Thougths	- Formal *vs*. informal practice -Integrating practice and competition -Finding a home in the body - Helpful practice for athletes Commitment -Content and physically experienced processes; - Removing judgment and self-criticism; Cognitive fusion -Methods of experiencing thought (timing, counting, listening, thought process visualizations)	-Mindfulness of thoughts - Mindful yoga	-Noting Meditation -Mediation on thoughts, Smart Phone App/ email audio exercise -Selected Readings/ Worksheets STOP: The One Minute Breathing Space Mindful Yoga and Sitting
5 - Emotions, meaning in sports life. Radical acceptance	-What are emotions and physical sensations; -No Bad or shameful emotions -Identifying/ labeling to mitigate impact; Experiential avoidance - Emotion lifespan; - Mindfulness of emotions pre, match, post-match	- Finding a home in the body Mindful yoga -Values and committed action Importance of acceptance versus resignation Letting go RAIN four step process: Recognize, Allow, Investigate, and Non-Identification	-Finding a home in the body -Creating a Practicing committed action Everything is perfect as it is -Ongoing formal and informal practice
6 - Mindfulness and imagery	Flow Exposure Sport mindfulness Common problems Focus on the task	Mindful yoga Imagery as a tool to. Recall success; Rehearse a game plan; remain focused; remind your goal Compassion imagery exercise on sport context. Awareness of your best performance. Review of 3 A´s of mindfulness: Aware, Accept and Action	Ongoing practice Compassion imagery Remember and repeat: Aware, Accept and Action Selected pre, match and post-match worksheets Body Scan, Sitting, Mountain meditation
6a - Silent mindful running and self-compassion		Silent Mindful Walking/mindful running in nature (90-120 minutes) The compassionate letters	Ongoing practice - Mindfulness in breathing one minute meditation - Mindful walking - Body scan Receiving affection from friends, strangers and enemies - Metta (to others and oneself)
7 - Mindfulness Acceptance and Compassion-Body connection & athlete recovery	Ways of training compassion: receiving compassion, showing compassion to oneself and to others Fear of compassion. Shame	Mindfulness of emotions Mindful yoga Loving Kindness Exercise/compassion flow/imagery The compassionate letters experience review	Ongoing practice Breathing practice - 3-minute breathing space in pairs – Closing Metta Body Scan, Sitting, Loving kindness, yoga Mindful Eating, STOP, etc
8 - Ending MBSoccerP		Body scan review Compassion sport imagery Diffusion, values, flow and acceptance review. Mindful yoga	Enhance ongoing MBSoccerP practice

Table 2. Descriptive Statistics, Paired t-tests, and Effect Size Estimates (Hedges g) for all Study Variables (n= 57).

Variables	Pre-test		Pos-test		Paired t-test	*p*	Effect size *d*
	M	SD	M	SD	*t*		
AAQ-II	19.93	7.04	18.98	3.84	1.10	.276	.14
SCS-total	19.61	2.57	20.71	2.76	-3.84	.000	.51
SCS-Isolation	3.64	0.76	3.73	0.63	-1.03	.306	.14
SCS-Mindfulness	3.23	0.56	3.57	.64	-4.05	.000	.53
SCS- OverId	3.36	0.71	3.42	.71	-.77	.45	.53
SCS-SelfKidness	2.98	.62	3.14	.71	-1.90	.063	.25
SCS-CHum	3.23	.80	3.36	.74	-1.53	.133	.20
FFMQ-Describe	3.39	.55	3.38	.52	.067	.95	.01
FFMQ-Awareness	3.91	.72	3.90	.57	.285	0.78	.04
FFMQ-No React	2.92	.54	3.20	.60	-2.43	.019	.33
FFMQ-NoJudge	3.20	.70	3.51	.63	-3.91	0.00	.52
DFS2 – Total	3.75	.52	3.90	.33	2.24	.029	.28
BSI-IGS	1.62	.41	1.50	.24	3.67	.001	.48
BSI-Anxiety	1.60	.40	1.38	.26	5.27	.00	.69
WBSI-Total	47.54	7.80	40.25	9.90	5.71	.00	.75

DISCUSSIONS

The current study provides preliminary evidence of the impact of the MBPSoccerP on elite soccer players and provides insight on the role of mindfulness, compassion, psychological flexibility on flow, psychological distress/anxiety and thought suppression.

Athletes who took MBSoccerP training demonstrated positive changes with effect sizes in the moderate to high range on thought suppression, psychological distress, anxiety symptoms, mindfulness facet- non judgment, mindfulness facet- non react, self-compassion and self-compassion sub-scale-mindfulness. Dispositional flow had the smallest effect size and was the all constructs that demonstrated a statistically significant change from pre to post intervention.

Also, in our study mindfulness facet non-judgment predicted lower thought suppression, psychological distress and anxiety at post intervention. Self-compassion predicted lower psychological distress and anxiety.

Hence, in our study and corroborating past literature findings confirm thought suppression has an avoidant function in the role of psychological inflexibility (Tull, et al, 2011). Excessive mental thoughts have been considered important factors in the self-regulatory model that will most likely lead to dysfunctional performance. In addition, greater self-awareness may lead to enhanced psychological flexibility in sports performance (Carraça et al., 2018; Gardner, & Moore, 2006, Kaufman, Glass, & Pineau, 2018). Acceptance of negative internal states might be one factor that has a positive impact on athlete's self-confidence and flow state as a player. The ability to be more mindful and accepting towards internal states might also help the athletes cope better with stress in general, as well as in performance-related situations (Gardner, & Moore, 2012; Kaufman, Glass, & Pineau, 2018).

According to our initial predictions, there were significant differences between the MBSPsoccer group and the control group in their tendency to suppress their thoughts. In fact, the intervention group WBSI scores were different at the start and at the end of the program, maybe because they learned alternative strategies that would promote acceptance and non-judgment of negative thoughts with kindness. From a cognitive perspective, mindfulness can be utilized to promote metacognitive awareness, which is learning to observe your thoughts and/or emotions without perceiving it as an absolute reality. Interestingly, the intervention group also exhibited improvements in their ability to be non-reactive to their inner experiences, yet they continued to engage in the low amount of thought suppression at the end of the program. Mindfulness-based training is strongly related to well-being, emotion regulation, and perceived health. The findings suggest that dispositional mindfulness might buffer against the negative influence of perceived stress on psychological well-being (Bränström, Duncan, & Moskowitz, 2011; Gregório & Pinto Gouveia, 2007, 2011, 2013; Palmi, & Planas, 2017; Solé, Carraça, Serpa, & Palmi, 2014).

Elite athletes with higher levels of mindfulness who also use mindfulness techniques on a regular basis are better at both reducing anxiety and having a better ability to cope with the anxiety and stress they experience (Kaufman, Glass, & Pineau, 2018; Scott-Hamilton, Shutte, Moyle, & Brown, 2016). The results may suggest that more psychological inflexibility players were prior to the intervention, more mindfully they were, more flow and compassion they get. These results are supported by previous research as Gardner and Moore (2004, 2007, 2009, 2012) and Carraça, Serpa, Palmi, and Rosado (2018) suggested that greater self-awareness may lead to enhanced psychological flexibility in sports performance.

Also research has shown that mindfulness has been linked to significant and positive relations with psychological flexibility and flow in previous correlational and intervention studies (e.g., Aherne, et. al., 2011; Carraça, et al, 2018; Kee & Wang, 2008; Kaufman, Glass, & Pineau, 2018; Thompson, et al., 2011; Zhang, Shung, & Si, 2015). As shown in our study, the intervention group had consistently reported higher experiential acceptance, flow, throwing than the control group. As such, these findings provide further support on our theoretical proposition that compassion, mindfulness acceptance and commitment programs can facilitate experiential acceptance and flow experiences which can in turn help athletes acquire new skills in sport (Gardner, 2016; Gardner, & Moore, 2007, 2012; Langer, 2000, Pineau, Glass, & Kaufman, 2014). As an important component in MBSoccerP, exceptional acceptance helps soccer players to accept the inconsistencies and incoherencies faced (Gardner, 2016; Langer, 2000). Given that flow experience is consistent with the characteristic of autonomous stage of performing (for example, knowing what to do without conscious attention control; Jackson, 2016). In addition, mindfulness is connected to heightened levels of flow, flexible thought processes, emotional regulation and reduced anxious moments. Research is also continually becoming clearer about its ability to improve sports performance. (Longshore & Sachs 2015; Birrer, Rothlin, & Morgan, 2012).

Although it is still frequently used but seldom studied, thought suppression continues to be pervasive throughout sports (Aherne, et al., 2011; Briegel-Jones, et al. 2013; De Petrillo, et al. 2009; Goodman, Kasdan, Mallard, & Schumann 2014; Kaufman, Glass, & Pineau, 2018). It may be argued that the mindfulness-based soccer practice therefore is about approaching any given situation and accepting it without judgment while simultaneously being fully aware of it. This approach could be beneficial to athletic performance as it trains athletes to be fully present in the moment. In line with our study, research suggests that mindfulness is a teachable concentration-related talent that encourages individuals to optimize their focus on the present moment (Aherne, et al., 2011; Carraça, et al., 2018; Kaufman, Glass, & Pineau, 2018)

In doing so, athletes in MBSoccerP are encouraged to accept their feelings rather than suppress or eliminate disrupting sentiments and thoughts. MBSoccerP training therefore discourages thought stopping and highlights bodily awareness, often including body cantered exercises such as "focused breathing" in practice. PST programs are concerned about the deliberate engagement of bodily cues, whereas mindfulness practices emphasises a more reflexive and non-judgmental acceptance of experienced feelings (Carraça, et al., 2018a, 2018b; Gardner, 2016; Demarzo, et al, 2015; Palmi, Planas, & Solé, 2018; Solé, et al, 2014).

In the present study and in line withthe recent research in the field (Carraça, et al., 2018a, 2018b, Carraça, Serpa, Rosado, & Palmi, 2019; Mosewich, Crocker,

Kowalski, & DeLongis, 2011, 2011, 2013; Solé et al., 2014) self-compassion predicts lower psychological distress at post MBSoccer intervention. The self-compassion component of the MBSoccerP intervention appeared to be successful, resulting in higher levels of some self-compassion positive traits, and lower levels of psychological distress, anxiety compared with control group. So self-compassion seems to decrease player's self-criticism and increase the playfulness. Previous research supports the association between self-compassion and cognitions and emotions in the sport domain (Kaufman, Glass, & Pineau, 2018; Mosewich, et al, 2011, 2013).

Hence, research suggests self-compassion has been suggested to be a potential resource in elite sport (Carraça, et al., 2018; Mosewich, et al., 2011, 2013) and the current study is a step toward establishing efficacy and effectiveness support for the MBSoccerP training intervention approach. As our knowledge, the present study is the first to examine self-compassion in a mindfulness-based framework in the elite male soccer domain and provides empirical evidence to support promotion of self- compassionate frames in new wave of psychological skills training for high performance in soccer athletes.

Practical implications

This study has practical implications for athletes and coaches. MBSoccerP intervention revealed additional insights on the effects of mindfulness, compassion and psychological flexibility training across many aspects of elite soccer-athletes' lives. Thus, it is important to consider that the enhancement performance does not occur in isolation and that it may be dependent on functionality and balance of all other aspects of a soccer athlete's life. To that end, implementing MBSoccerP training that emphasizes increasing functionality of different areas of an athletes' mental and physical life can lead to enhanced soccer performance. The results of the study demonstrated that MBSoccerP program can be an effective tool in helping bridge the gap between a range of various psychological traits of personal and team athletes' lives.

Lastly, another aspect that needs to be considered when implementing the MBSoccerP, at least in elite soccer, is the training need to be adapt to competition, be flexible and experiential. We need to be aware of the demanding nature of elite soccer and consider that being compassionate, flexible and mindful of the present moment might help deal with e the pressures of winning and with the sudden changes in scheduling.

Table 3. Correlations between Mindfulness (FFMQ), Self-Compassion (SCS), Psychological Flexibility (AAQ-II), Psychological Distress (BSI), Anxiety (BSI-anxiety), Thought Suppression (WBSI) and Dispositional Flow (DFS 2), Pre- and Post-Intervention.

	1.	2.	3.	4	5.	6.	7.	8.	9.	10	11	12	1a	2a	3a	4a	5a	6a	7a	8a	9ª	10a	11a	12a
1. AAQII-total pre	__	-.43**	-.62**	-.36**	-.56**	-.024	-.56**	-.40**	.098	.50**	.63	.47**	-.41**	-.32*	-.42**	-.24	-.31*	-.39**	-.16	-.19	-.18	.49**	.47**	.33*
2. DFS-total pre		___	.58**	.46**	.39**	.05	.15	.34**	.153	-.27*	-.31*	-.10	-.19	.33*	.38**	.099	.099	.096	-.02	.004	.14	-.07	-.29*	-.13
3. SCS-total pre			____	.45**	.51**	-.14	.43**	.21	-.04	-.47**	-.58**	-.40**	-.19	.11	. 67**	.34*	.25	.39	.21	-.01	.08	-.38**	-.47**	-.20
4. SCS- Isol pre				_____	.44**	.56**	.61**	.21	.09	-.482**	-.49**	-.43**	.05	.15	.30**	.58**	.23	.26*	-.06	-.11	-.01	-.26*	-.38**	-.18
5. SCS– Mindfulness pre					____	.15	.41**	.53**	.097	-.34*	-.40**	-.18	-.13	.31*	.34**	.34**	.44**	.28*	0.01	.24	.14	-.16	-.31*	-.09
6. SCS- Self Jud. pre						___	-.15	.19	-.04	-.38**	-.38**	-.39**	-.13	-.16	-.19	-.18	-.02	-.001	-.16	-.016	-.05	-.31*	-.40**	-.24
7. SCS-Over.Ident pre							___	.13	-.12	-.34**	-.51**	-.56**	-.21	.15	.54**	.32*	.37**	.39**	.58**	.17	.25	-.46**	-.47**	-.35**
8. SCS-S.Kind. pre								___	.24	-.22	-.27*	-.06	-.19	.09	.12	-.07	.53**	-.15	-.10	.45**	.01	-.22	-.22	.09
9. SCS-CHum pre									___	-.03	-.14	.11	.12	-.02	.07	-.07	.07	-.26	.12	.24	.19	-.04	-.03	.03
10. WBSI total pre										____	.66**	.57**	.44**	-.05	-.19	-.31*	-.03	-.18	-.05	-.08	-.05	.43**	.42**	.21
11. BSI-IGS pre											____	.89**	.39**	-.18	-.38**	-.44**	-.25	-.25	-.21	-.24	-.16	.47**	.78**	.56**
12. BSI –anxiety pre												___	.32*	-.11	-.28**	-.39**	-.11	-.31**	-.29*	-.15	.09	-42**	.66**	.61**
1a. AAQII-total post													____	-.06	.01	.28*	-.15	.06	-.23	-.30*	.11	.25	.39**	.27*
2a. DFS-total post														__	.28*	.34**	.48**	.27*	.16	.11	.18	-.21	.11	-.21
3a. SCS-total post															____	.40**	.58**	.47**	.50**	.27*	.30*	-.54**	-.43**	-.29*
4a-SCS Isol post																___	.42**	.57**	.61**	-.11	.12	-.49**	-.49**	-.20
5a- SCS Mindf post																	___	.38**	.29*	.59**	.65**	-.38**	.25	.04
6a- SCS-Self Judg post																		___	.78**	.17	-.06	-.34*	-.30*	.18
7a-SCS – OverIden post																			____	-.10	-.15	-.38**	-.34**	-.26*
8a- SCS – Skind post																				___	.68**	-.33*	-.23	-.20
9a-SCS CHum post																				.	___	-.27*	-.13	.71
10ª – WBSI total psot																						___	.66**	.61**
11ª – BSI-IGS post																							___	.68**
12ª BSI-anxiety post																								__

Table 4. Hierarchical regression with baseline mindfulness, self-compassion and psychological flexibility on flow (DFS2), thought suppression (WBSI), psychological distress(BSI-IGS) and anxiety (post-intervention) controlling for DFS2, WBSI, BSI-IGS and BSI-anxiety at baseline.

Predictor variable	**B**	**SE B**	**β**	R^2	**Adjusted** R^2	**F**
			DFS-2 total post			
Step 1						
AAQ-II total pre				.103	.086*	6.30
	-.182	.073	-.32*			
			WBSIpost total			
Step 1						
FFMQ-Non Judg pre				.34	.32 **	27.78
	-8.13	1.54	-.58**			
			BSI-IGS post			
Step 1						
FFMQ-Non Judg pre				.24	.23**	17.70
	-.17	.04	-.49**			
Step 2						
FFMQ-Non Judg pre	-.12	.04	-.36*	0.32	.30**	6.31
	-.03	.01	-.31*			
SCS-total-pre			**BSI-Anxiety post**			
Step 1						
SCS-OverIdentif pre				.12	.11*	7.59
	-.13	.046	-0.17	.04	-.49**	

Limitations

In this study, limitations include participants' gender (only males were included), sample size and the fact just one sport discipline (soccer) was considered. Another potential limitation to this study was the assessment of formal and informal mindfulness and compassion practices. Another limitation was the lack of a direct performance measure that could serve as a marker to find any impact of MBSoccerP training on performance. Thus, not having a direct performance measure eliminates the chance of determining MBSoccerP effectiveness' on actual athlete's performance enhancement.

Future research directions

Further studies are needed to test the mechanisms in which way Mindfulness-based soccer programs influence directly elite performance in different elite soccer contexts and other elite sports (individual and collective). Future studies need larger samples that can better determine the real impact of MBSoccerP in elite sports through quantitative and qualitative approaches. Another potential research area is the importance of adapting specific performance measures according to the type of sport, athletes and coaches. This would help to better assess the effectiveness of MBSoccerP training on athletes performance, as well as increasing the intrinsic motivation and awareness to practice mindfulness, compassion and acceptance as psychological skills training tools to help enhance their performance and personal, family and professional well-being.

CONCLUSIONS

In summary, the present study provided initial evidence supporting the application of a MBSoccerP training not only appeared to be adaptive to elite soccer experience and flow improvement, but it also seemed to reduce the psychological distress, anxiety and thought suppression (Carraça, et al., 2018, 2019; Kaufman, Glass, & Pineau, 2018; Palmi, & Solé, 2016; Solé, et al., 2014).

Together with findings from previous research, the results suggest that increasing athletes' mindfulness, self-compassion and psychological flexibility traits has implications for athletes' performance enhancement experience during sporting events as well as general mental health literacy and well-being aspects of their life outside of elite sport contexts (Kaufman, Glass, & Pineau, 2018; Palmi, & Riera, 2017, Palmi, Planas, & Solé, 2018).

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COMPLIANCE WITH ETHICAL STANDARDS

All procedures performed in that study were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments ethical standards.

CONFLIT OF INTEREST

The authors declare that they have no conflict of interest.

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