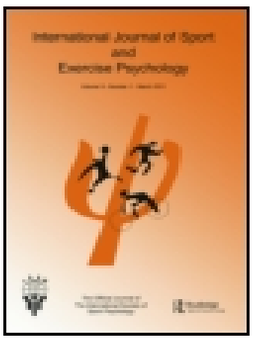

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The effects of rational emotive behaviour therapy on performance under pressure in adolescent soccer athletes: a randomised control design

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ABSTRACT

Although several studies have reported the effects of rational emotive behaviour therapy (REBT) with athletes, significant methodological limitations have been observed in the extant research. These include a lack of randomised control trials (RCT), a lack of objective performance measurement, and often poor internal and external validity. Accordingly, these limitations are addressed in the present study, and the effects of REBT on performance under pressure in adolescent soccer players are assessed using an RCT design. In this study, 24 adolescent soccer players were recruited. After completing pre-intervention measures of irrational beliefs, social anxiety, and performance under pressure, players were divided into two groups, an experimental ($n = 12$) and placebo control group ($n = 12$). The experimental group underwent ten REBT sessions and the placebo control group underwent ten sessions of video clips related to new soccer technologies. Indicators of irrational beliefs, social anxiety, and performance under pressure were collected at a post-intervention and at a four-month follow-up. Results demonstrated a significant decrease in irrational beliefs and social anxiety and an improvement in performance under pressure in the experimental group, compared to the placebo control group. These significant changes were maintained in the experimental group at follow-up. Results are discussed in relation to advancements to the extant research, and recommendations for future applied work are proffered.

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CBT; attainment; stress; practice; soccer

In striving to fulfil their athletic performance potential, players within soccer academies encounter many adversities and challenges that beset their aim for excellence. Challenges include concrete events such as high training intensity, illness, injury, and deselection (Darpatova-Hruzewicz, 2021), but also inferential events such as perceived unfairness,

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rejection, and failure (Turner, 2016). Indeed, the athletic context is rife with high demands and psychological pressure (e.g., Hughes & Leavey, 2012; Nixdorf et al., 2013), whilst simultaneously learning to cope with the fact that the chances of becoming a professional soccer player are slim (success rate of 0.012%; Calvin, 2018). As well as this, there are additional socio-cultural pressures unique to soccer players in Iran, as soccer is now the most popular sport in the country, increasing the quantity of youth athletes hoping to become professional, proliferating pressure experienced (Chehabi, 2006). The pressure experienced by young soccer players can lead to burnout (Turner & Moore, 2016), overtraining (Brink et al., 2012), injury (Auer et al., 2020), debilitated skill execution (Mesagno & Hill, 2013), as well as depression, anxiety, low self-esteem (i.e., mental health; Gouttebarge et al., 2015), and drop out (Darpatova-Hruzewicz, 2021). Therefore, strategies that soccer players can use to maintain or even improve mental health and performance under pressure are particularly valuable.

Researchers have developed and tested strategies to help soccer players cope with pressure. For instance, Olmedilla et al. (2019) studied the effectiveness of a psychological skills training intervention (based on broad cognitive behavioural principles) to control stress in young soccer players. Eight 50-minute sessions led to increases in stress control and mental skills, and reductions in responsiveness to judgement from others in both training and competition. In a meta-analysis, Brown and Fletcher (2017) examined the effects of psychological interventions on performance, with results indicating that psychological and psychosocial interventions had a moderate effect on performance. In a recent meta-regression, positive support was found for the effectiveness of psychological skills training and behavioural interventions underpinned by cognitive behavioural principles in enhancing psychological outcomes, behaviour change (e.g., inappropriate outbursts), and performance (Barker et al., 2020). One cognitive behavioural framework that is emerging as an effective approach to sport psychology is rational emotive behaviour therapy (REBT; Ellis, 1957; Turner, 2019). In a recent systematic review of applied research reporting the application of REBT with athletes, Jordana et al. (2020) found that REBT is particularly effective in soccer populations for the treatment of anxiety, including competitive and social anxiety. In line with the current papers' focus on soccer, various studies and applied accounts (e.g., Barker, 2018) report the successful application of REBT with soccer players (Wood & Turner, 2020) to reduce irrational beliefs (Turner et al., 2014, 2015), and increase the perceived helpfulness of pre-performance anxiety, alongside decreases in physiological markers of arousal prior to penalty kicks (Wood et al., 2018).

In addition to these potential performance-enhancing effects, Turner et al. (2020) and Bowman and Turner (2022) identified in a single case design, that REBT can also alleviate social anxiety in golfers. Social anxiety is characterised by apprehension, self-consciousness, and emotional distress within or in anticipation of social-evaluative situations and arises as a result of a perception of potential scrutiny by others (Leitenberg, 1990). Indeed, social anxiety can arise via the *perception* of social evaluation ("I will be judged"), in the absence of an *actual* social-evaluative stimuli (e.g., spectators), evidenced by the anxiety being out of proportion to the actual threat posed by the social situation (National Collaborating Centre for Mental Health, 2013). As such, as pointed out by Turner et al. (2020), social anxiety is highly relevant to sporting performance in competitive situations, whereby "Individuals with performance anxiety usually have no difficulty with

social interaction, but when they must do something specific in front of people, anxiety takes over and they focus on the possibility that they will embarrass themselves" (Barlow & Durand, 2012). Thus, by focusing on reducing social anxiety in athletes, it might be possible to observe performance enhancements within pressure situations.

Much of the past REBT research in sport that reports performance gains uses anecdotal data, and it is perhaps unsurprising that perceptions of performance improve as a result of REBT (e.g., Wood et al., 2017); athletes might feel better, and thus might subjectively infer performance gains. However, research is punctuated by a lack of understanding of the influence of REBT on *objective* performance markers and social anxiety in a significant number of individuals. Additionally, there is also a relative lack of experimental stringency in REBT research (i.e., use of placebo controls), and REBT tends to be delivered briefly. Therefore, in the current paper, an experimental Randomised Control Trial (RCT) design is adopted to assess the effects of REBT on the irrational beliefs, social anxiety, and objective performance under pressure of academy soccer players.

REBT is predicated on the idea that whilst the goal incongruent events we experience importantly shape our emotions, it is our beliefs concerning these events that determine the extent to which our emotions are adaptive or maladaptive for goal attainment (Outar et al., 2021; Turner, Wood, et al., 2019). In other words, how an individual perceives and reacts to an event is shaped by thier beliefs in connection to that event (Dryden, 2009). This ethic is captured by the GABC framework, in which emotional consequences (C) are a result of rational or irrational beliefs (B) concerning the adversity (A) we experience in relation to our goals (G). Irrational beliefs (IBs) are rigid, extreme, and illogical and underpin unhealthy negative emotions (e.g., anxiety, anger, guilt), being counterproductive for goal attainment. In contrast, rational beliefs (RBs) are flexible, non-extreme, and logical and underpin healthy negative emotions (e.g., concern, frustration, remorse) and productive behaviours for goal attainment (Davis & Turner, 2020; Szentagotai & Jones, 2010). In sport research, irrational beliefs have been related to psychological distress (Turner, Aspin, et al., 2019a), trait anger (Turner, Carrington, et al., 2019b), increased burnout (Turner & Moore, 2016), threat appraisal and negative affect (Chadha et al., 2019), and poorer performance under pressure (Mesagno et al., 2020).

Ultimately, two individuals can respond differently to a similar situation owing to their different perceptions and beliefs (Maclaren et al., 2016). Therefore, the chief aim of REBT is to help individuals recognise that they can shape their emotions and behaviours, by weakening their irrational beliefs and strengthening rational beliefs (e.g., Ellis, 1994). The GABC framework is extended by adding disputation (D) and effective new beliefs (E), becoming the GABCDE framework (see Chadha et al., 2019; Chrysidis et al., 2020). Specifically, individual irrational beliefs are disputed (D: challenged collaboratively) and rational beliefs are developed and committed to (E). The process of challenging irrational beliefs and promoting rational beliefs in sport is especially important because outcome environments can intensify irrational beliefs in players whereby rational preferences ("I want") can become irrational demands ("I want, therefore I must"; Turner et al., 2014; King et al., 2022). Indeed, some authors suggest that sport promotes irrational beliefs due to the use of irrational language such as terrible, devastating, and awful, and the positioning of value (self-worth) as dependent or conditional on goal attainment (Turner, 2016; 2019).

With regards to psychological pressure, it has been found that golfers perform better under pressure when utilising rational self-talk (Turner, Wood, et al., 2019), and that when highly anxious, Australian Soccer players are more likley to choke under pressure when they hold high irrational beliefs (Mesagno et al., 2020). This is important because one meta-analysis reported that irrational beliefs relate to psychological distress more strongly in the presence of a real and personally relevant stressor (Vîslă et al., 2016). Chadha et al. (2019) found that golfers with high irrational beliefs who also appraised an upcoming competition as personally relevant but goal incongruent, anticipated that they were not likely to achieve their goal, and more likely to appraise the competition as a threat. As a result, the golfers reported greater anxiety, more negative mood, and a debilitative interpretation of their anxiety. To this tune, helping players weaken their irrational beliefs in the face of pressure situations seems important for adaptive emotional responding and skilled performance.

One specific type of anxiety that researchers have applied REBT to with athletes is social anxiety (Turner et al., 2020). It was found that applying REBT with golfers concerning their irrational beliefs led to decreases in social, and golf-specific, anxiety. Golfers also reported some increase in performance, but this was captured subjectively at a social validation point. Aside from golfers, the experience of social anxiety in academy soccer players is an important consideration given that they are required to execute skilled performance in a public and highly evaluative setting. According to the National Institute for Health and Care Excellence (NICE) social anxiety guidelines published by the National Collaborating Centre for Mental Health (2013), the hallmarks of social anxiety include a disproportionate (excessive) fear and anxiety of social situation/s (such as those involving interaction, observation and performance) where embarrassment may occur. This can include public performance where individuals experiencing social anxiety fear that they will do something (involuntarily or otherwise) that they think will be humiliating or embarrassing (such as appearing stupid or incompetent). This can be problematic for performance in part because individuals experiencing social anxiety may attempt to avoid the feared situations, which is not often feasible in sport, and therefore they will endure the situation amidst feelings of intense distress, leading to significant impairment in functioning. It is apparent that social anxiety is relevant to competitive athletes, and REBT offers some promise in helping to ameliorate social anxiety in athletes (e.g., Turner et al., 2020) by weakening irrational beliefs that concern anxiety-provoking socially evaluative situations.

Although REBT is finding increasing application in sport, few studies have examined how REBT may influence performance in real-life competitions. In one such study, Wood et al. (2018) found that one-to-one REBT enhanced objective performance markers of elite Paralympic archers. However, in another study with Paralympic soccer players, brief group-based REBT education did not lead to performance increments. Conclusions concerning the effects of REBT on soccer performance are difficult to draw, because of the limitations hindering the extant research, including low sample sizes, lack of placebo control, and very brief intervention duration.

The present paper attempts to address these limitations by assessing the effects of a 10-session REBT programme on soccer performance under pressure, alongside irrational beliefs and social anxiety, using an RCT design. RCTs are a highly stringent way of determining whether a cause–effect relation exists between an intervention and target

outcomes, and a methodologically sound RCT can provide strong evidence of a cause–effect (Didymus, 2018). By using a stringent RCT design we aim to provide a reliable test of REBT in soccer players. The soccer players underwent 10 REBT sessions, surpassing the quantity utilised in previous research (Davis & Turner, 2020; Wood et al., 2017). It is hypothesised that a 10-session group-based REBT programme will lead to pre–post decreases in irrational beliefs and social anxiety, and increases in performance under pressure, compared to a placebo control group. We also hypothesise that the observed effects will be maintained at a four-month post-REBT follow-up assessment. This is because REBT has been found to be efficacious in alleviating irrational beliefs and outcome variables such as social anxiety, maintaining such effects over time (Davis & Turner, 2020; Turner et al., 2020). However, much REBT in sport research does not assess longer-term effects (see Jordana et al., 2020), and thus in the present study, we wanted to ensure we captured a longer-term follow-up data point, not just an immediate post-REBT data point.

Method

Participants

After obtaining institutional ethical approval and parental consent, twenty-four Under-17 Iranian male soccer players (M_{age} = 15.9 years, SD_{age} = .97 years; age range = 15-17 years) participated in the study. All players were participants in the Shiraz adolescent Premier League in Iran, representing four teams. All participants had at least three years (M = 4.75, SD = 1.48) of experience in club soccer. The experimental group consisted of 12 players (M_{age} = 16 years, SD_{age} = .21 years; $M_{experience}$ = 4.91 years, $SD_{experience}$ = .28 years), and the placebo control group consisted of 12 players (M_{age} = 15.83 years, SD_{age} = .34 years; $M_{experience}$ = 4.58 years, $SD_{experience}$ = .54 years), and all players attended all sessions.

Design

To examine the effectiveness of the REBT programme, an experimental design was used with pre-test, post-test (immediately following the intervention), and follow-up (four-months following the intervention) data collection timepoints. One of the chief limitations of past research was that applied studies have not used an RCT design, and so, in the present study we employed an RCT experimental (parallel, superiority) design whereby participants were randomly assigned to either an experimental group (receiving REBT), or a placebo control group (receiving soccer technology videos). There was an unequal split of participants from each team, thus participants were split into conditions on an athlete level. The principal investigator was given 24 envelopes with a sheet of paper inside from the second author. 12 envelopes enclosed "condition A" and 12 enclosed "condition B" (blinding REBT vs control). From this point, all participants were informed that no one is to share information about what they are doing to those in the other condition, and participants from both conditions were informed of this at each session. This form of individual randomisation minimises the potential drawbacks of clustered effects (e.g., the whole team conspiring to take the intervention less seriously/the whole team

communicating to amplify effectiveness) which can demand larger sample sizes and may suffer from selection bias (Torgerson, 2001). After the intervention, differences in the target variable change between the two groups were then assessed to determine REBT effectiveness. RCTs are considered to be a stringent way of determining whether a cause–effect relation exists between the intervention and the outcome (Kendall, 2003). As far as we know to date, no research study reporting the effects of REBT with athletes has employed an RCT design (e.g., Jordana et al., 2020). The application of an RCT design in the present study can reduce Hawthorn effects and increase the internal validity of the research (Berg & Latin, 2008). Regarding statistical power, there is precarity in how many athletes are necessary. The present study is the first to utilise an RCT design within REBT (i.e., Jordana et al., 2020), thus power calculations are based on minimum expectations as evidenced in previous single case designs (Wood et al., 2017) and experiments ($\geq \eta p^2 = .17$; Turner et al., 2018). Using G*Power (Faul et al., 2007), it would be anticipated that 24 participants are needed to achieve a large effect ($\eta p^2 = .17$; $f = .45$, $p < .05$, $1-\beta > .80$) based on a mixed (within-between) analysis of variance (ANOVA) which drove our recruitment strategy.

Measures

Irrational beliefs. The irrational performance beliefs inventory (IPBI; Turner et al., 2018) contains 28-items and was developed for use in performance settings such as sport. The Persian version of the iPBI (Nejati et al., 2021) has 22-items that measure four core irrational beliefs: demandingness (e.g., "my teammates should respect me"), frustration intolerance (e.g., "I can't stand not making progress every single day"), awfulising (e.g., "it's awful to have your position in the team at risk"), and depreciation (e.g., "If I face setbacks it goes to show how stupid I am"). Responses are rated on a 5-point Likert-scale from 1 (*strongly disagree*) to 5 (*strongly agree*). The Persian version of the iPBI demonstrates sufficient fit indices (CFI = .96; TLI = .96; RMSEA = .06), internal consistency (Cronbach's alpha = .77-.84), and test-retest reliability (interclass correlation coefficient = .96; Nejati et al., 2021). For the current data, Cronbach's alphas were .90 (pre), .97 (post), and .90 (follow-up).

Social anxiety. The Liebowitz Social Anxiety Scale (LSAS-SR7) is a 34-item questionnaire that measures fear and avoidance of particular situations. We have chosen to use this measure because (a) we aim to understand whether REBT improves social anxiety, and (b) because this scale has been used in similar REBT interventions with athletes previously (Turner et al., 2020). Items are scored from 0 (*none*) to 3 (*Severe*) for the fear subscale, and from 0 (*never*) to 3 (*Usually*) for the avoidance subscale (Baker et al., 2002). LSAS-SR7 also generates a total score by summing the total fear score and total avoidance score, ranging from 0 to 24. The Persian version of LSAS-SR (Baker et al., 2002) shows sufficient test-retest reliability ($r = .76$-$.84$), internal consistency (Cronbach's alpha = .73-.93), and convergent validity (Rahmani et al., 2020). For the current data, Cronbach's alphas were .93 (pre), .89 (post), and .70 (follow-up).

Performance under pressure. Previous research has recommended and used in-game statistics from real competitions to determine generalisable performance effects of psychological skill training (PST; Gardner & Moore, 2006; Martin et al., 2005). However, in order to assess the effects of interventions on performance under pressure, researchers

have used specific pressure situations (in pre, post and follow-up tests) via an experimental paradigm in order to create a controlled measurement environment (e.g., Turner, Kirkham, et al., 2018). That is, rather than operationalising pressure in an actual match in which pressure might or might not be naturally induced, it might be more advantageous to induce pressure in order to attain some equality of pressure inducement across participating athletes.

Indeed, a critical demand on top-level performers is their ability to cope when executing motor skills under conditions of high competitive stress (Carson & Collin, 2020), and as such, testing skilled performance under pressure has been recommended to properly assess motor skill execution (Lam et al., 2009). In this type of test, athlete's performance is examined under real competitive situations, and they are video-recorded in order to help induce pressure (Balk et al., 2013). In addition, Balk et al. (2013) and Lam et al. (2009) propose two strategies to increase perceived pressure in athletes. The first strategy involves asking a practitioner (in the current study, a coach or a technical director) to be present at the place where the test is conducted. The participants are told that the test is designed as a talent search programme to select players for a college team. The second strategy involved instructing participants that they would join a team to play at a higher and better level of competition if they get higher scores in the test, while players with lower scores would risk their position in the current team. Therefore, in the current study, in order to maximise perceived pressure for the test, players were video recorded, told that the test was a talent search, that their performance in the test would be provided to the managers and coaches of the club, and that their score could dictate their team selection. The pressure inducing elements of the procedure were all based in fact – the task that the athletes took part in was an important test of their competencies and there were potentially negative consequences for poor performance, just like in any meaningful competition. This type of pressure inducement has been both endorsed as a strategy in sport within a meta-analytical review (Low et al., 2021), and replicated in previous randomised controlled trials in order to gain an authentic and valid response to competition (e.g., Miller et al., 2021; Turner et al., 2013).

At each timepoint (pre, post, and follow-up), pressure was induced as is described above. All players underwent baseline performance testing under pressure, then they were split between two groups (REBT vs. control) and pressure tested again (post-test, and follow-up). Thus, changes in performance under pressure were measured by scoring players performance under pressure at pre and post timepoints. In other words, baseline (pre) was not undertaken without pressure being induced, and therefore, changes in performance reflect changes in performance under pressure rather than changes in performance per se.

The performance test. The contents of the performance under pressure test were decided in liaison with three top level (A license) soccer coaches. To measure the performance of the players at pre, post, and follow-up phases, three internal 80-minute club matches with standard soccer rules and regulations (aside from the duration) were held. All players took part in the match (randomly distributed into the two teams), which was played on a standard soccer field in two 40-minute halves. In each match three subcomponents were considered to indicate performance under pressure; passing, controlling and keeping the ball, taking the ball from the opponent and retaining possession. These subcomponents were selected because some previous research has

used these parameters to indicate soccer skill performance (e.g., Ali et al., 2007; Zeederberg et al., 1996) and these actions are overt and unambiguous. For the scoring, the researchers prepared a form based on these subcomponents and observed the video footage of the tests. Each player's test was observed and scored either with a "+" for successful performance or a "–" for unsuccessful performance, for each subcomponent. That is, each time a participant executed an action (pass, control, retain ball from opponent) they were given either a "+" or "–" for that action. Each player was assigned a number in order to anonymise the player to the scorer, who was blinded to the players' identities and group (experimental vs. control) they were allocated to. This was important to ensure that performance assessment was not positively biased by whether the player was the experimental group. The + and – values were then summed, divided by the total number of activities in each sub-component, and multiplied by 100. Each player's score represents a percentage (e.g., percentage pass completion), ranging from 0% (.00) to 100% (.100), and higher scores reflect better performance. This score for the three matches (pre-, post-, follow-up) was taken to indicate performance for each participant at each phase, and it is this average score that is used in the analyses.

Social validation. A questionnaire was administered to the participants at the completion of the intervention to assess participant reactions to the intervention procedures and experimental outcomes (Turner & Barker, 2013). The social validation questionnaire was designed to provide information concerning the importance of the study and the effectiveness of the intervention via the following questions: (a) "How important was an improvement in performance to you?" with responses ranging from 1 (*not at all important*) to 7 (*extremely important*); (b) "Do you consider the changes in performance to be significant?" with responses ranging from 1 (*not at all significant*) to 7 (*extremely significant*); (c) "How satisfied were you with the psychological skills training program?" with responses ranging from 1 (*not at all satisfied*) to 7 (*extremely satisfied*); (d) "Has the intervention proved useful to you?" with responses ranging from 1 (*not at all useful*) to 7 (*extremely useful*; Thelwell et al., 2006).

Procedure

REBT. The REBT intervention was implemented by the lead researcher who held a Masters of Science (MSc) Degree in Sport and Exercise Psychology. The lead researcher was supervised by a HCPC registered sport and exercise psychologist, who is an advanced REBT trained practitioner. The REBT intervention comprised 10 group-based REBT sessions as well as nine between-session homework tasks to be completed over a period of five weeks. The session content and schedules were determined in advance and were developed based on key REBT literature (Dryden & Branch, 2008; Ellis & Dryden, 1997; Turner, 2019). The REBT intervention was guided by the GABCDE framework and contained three phases: (1) training, (2) disputation, and (3) replacement, and reinforcement.

Phase 1, Training: This phase took three sessions to complete (Chrysidis et al., 2020). The training phase was intended to teach basic principles of REBT. In this phase, participants learned about how different (rational or irrational) beliefs (B) underpin different emotional responses or consequences (C) following an adversity (A) to a goal (G).

Phase 2, Disputation (D). This phase represented the most essential phase of the intervention which took four sessions to complete. In this phase, participants learned about the influence of irrational beliefs on their associated emotions and behaviors, and how to question and challenge these irrational beliefs. Participants were taught to challenge and weaken their irrational beliefs using logic, evidence, and pragmatism.

Phase 3, Replacement, and reinforcement (E). In this phase, which lasted three sessions, participants learned how to develop and strengthen new rational beliefs. They also learned to reinforce these beliefs and integrate them into their daily lives.

In between each session, participants were set homework assignments to complete independently. Homework assignments were designed to help participants practice important REBT elements using cognitive, emotive, and behavioural methods. Cognitive assignments involved deepening their understanding of the GABCDE framework, identifying daily rational and irrational beliefs, and keeping a journal of affective and emotional consequences. Emotive assignments included guided imagery for healthy emotions, and behavioural assignments included imagined self-exposure to anxiety provoking situations (e.g., objection to wrong decisions made by the coach, greeting everyone upon entering the training sessions, performing difficult skills on the pitch in the presence of others).

Placebo control. Participants watched videos that introduced and detailed the latest technologies used in soccer. These included electronic performance and tracking systems, goal line technology, video assistant refereeing, global positioning systems, referee communication systems, and performance analysis software. Discussions about the advantages and disadvantages of the various technologies were held, and possible future developments were discussed. The videos were chosen because they were relevant to soccer, thus maintaining engagement without focusing on any of the mechanisms being studied. Replicating common strategies using RCT's within psychology, we did not use homework tasks for the placebo control group (e.g., Titov et al., 2011).

Data analysis

Means (*M*) and standard deviations (SDs) for the target variables are presented in Table 1 (and all pressure test actions can be found in Table 2 of supplementary materials). These means and standard deviations highlighted that between experimental and placebo control conditions, participants reported similar intensity of global irrational beliefs, thus justifying the intervention conducted. Prior to main analyses, data were first inspected for missing values and outliers. There were no missing data, and following outlier screening, there were no data-points with z scores greater than 3.29 (Hahs-Vaughn, 2016). Tests of homogeneity and normality met the assumptions necessary (*p*

Table 1. Means ± SDs for all dependent variables between conditions and across time points.

	Pre		Post		Follow up	
Measure	Experimental	Placebo	Experimental	Placebo	Experimental	Placebo
Performance under pressure	.38 ± .07	.41 ± .03	.55 ± .14	.46 ± .07	.49 ± .07	.33 ± .07
Irrational beliefs	3.81 ± .13	3.78 ± .10	1.90 ± .22	3.66 ± .19	1.78 ± .17	3.83 ± .18
Social anxiety	2.64 ± .21	2.45 ± .27	1.45 ± .26	2.33 ± .35	1.58 + .18	2.56 ± .23

Note: Performance under pressure can be read as percentages (%) whereby, for example, .38 is equal to 38%.

> .05) for the application of mixed (within, between) ANOVA. Main analyses comprised mixed (within, between) ANOVA, which were conducted for pre to post-test scores and post to follow-up scores in irrational beliefs, social anxiety, and performance under pressure to assess changes in target variables between conditions. Post-hoc inter-group pairwise comparisons were conducted used using the Bonferroni test.

Results

Irrational beliefs

Post-intervention. The mixed ANOVA performed on irrational beliefs scores revealed a significant time, $F(1, 22) = 384.76$, $p < .001$, $\eta p^2 = .94$, group, $F(1, 22) = 359.97$, $p < .001$, $\eta p^2 = .94$, and time-group interaction, $F(1, 22) = 295.48$, $p < .001$, $\eta p^2 = .93$. Based on Bonferroni adjustment pairwise comparison, the experimental intervention (REBT) group reported decreased ($p < .001$, $\eta p^2 = .96$) irrational beliefs scores from pre-test ($M = 3.81$, SD = 0.13) to post-test ($M = 1.9$, SD = 0.22), whereas participants in the placebo control group reported no change ($p = .60$) in irrational beliefs pre-test ($M = 3.78$, SD = 0.10) to post-test ($M = 3.66$, SD = 0.19). Also, there was a significant difference between the experimental group ($M = 1.9$, SD = 0.22) and the control group ($M = 3.66$, SD = 0.19) at post-test based on Bonferroni adjustment test ($p < .001$, $\eta p^2 = .95$), which was not significant at pre-test ($p = .32$).

Follow-up. The mixed ANOVA revealed a significant group, $F(1, 22) = 935.87$, $p < .001$, $\eta p^2 = .97$, and a significant time-group interaction, $F(1, 22) = 8.68$, $p < .001$, $\eta p^2 = .28$. Pairwise comparisons based in Bonferroni test showed that there was a significant increase ($p < .01$, $\eta p^2 = .22$) in the placebo control group from post-test ($M = 3.66$, SD = 0.19) to follow-up ($M = 3.83$, SD = 0.18), whereas participants in the experimental (REBT) group reported no change ($p = .11$) in irrational beliefs from post-test ($M = 1.90$, SD = 0.22) to follow up ($M = 1.78$, SD = 0.17). In addition, there was a significant difference between the placebo control group ($M = 3.83$, SD = 0.18) and experimental group ($M = 1.78$, SD = 0.17) at follow-up based on Bonferroni adjustment test ($p < .001$, $\eta p^2 = .97$).

Social anxiety

Post-intervention. The mixed ANOVA revealed a significant time, $F(1, 22) = 91.85$, $p < .001$, $\eta p^2 = .80$, a significant group, $F(1, 22) = 14.13$, $p < .001$, $\eta p^2 = .39$, and a significant time-group interaction, $F(1, 22) = 61.65$, $p < .001$, $\eta p^2 = .73$. The nature of the interaction based on Bonferroni adjustment pairwise comparison, was such that participants in the experimental (REBT) group reported decreased ($p < .001$, $\eta p^2 = .87$) social anxiety scores from pre-test ($M = 3.81$, SD = 0.13) to post-test ($M = 1.45$, SD = 0.26), whereas participants in the placebo control group reported no change ($p = .23$) from pre-test ($M = 2.45$, SD = 0.27) to post-test ($M = 2.33$, SD = 0.25). In addition, there was a significant difference between the experimental group ($M = 1.45$, SD = 0.26) and placebo control group ($M = 2.33$, SD = 0.35) in post-test based on Bonferroni adjustment test ($p < .001$, $\eta p^2 = .68$), but this difference was not significant in pre-test ($p = .06$).

Follow-up. The mixed ANOVA revealed a significant effect for time, $F(1, 22) = 7.42$, $p < .01$, $\eta p^2 = .25$, and group, $F(1, 22) = 114.14$, $p < .001$, $\eta p^2 = .83$. Pairwise comparison based on Bonferroni test showed that there was significant increase ($p < .05$, $\eta p^2 = .20$)

in the placebo control group from post-test ($M = 2.33$, SD = 0.35) to follow-up ($M = 2.56$, SD = 0.23), whereas participants in the experimental (REBT) group reported no change ($p = .11$) in social anxiety from post-test ($M = 1.45$, SD = 0.26) to follow-up ($M = 1.58$, SD = 0.18). In addition, there was a significant difference between the experimental group ($M = 1.58$, SD = 0.18) and the placebo control group ($M = 2.56$, SD = 0.23) at follow-up based on Bonferroni adjustment test ($p < .001$, $\eta p^2 = .85$).

Performance under pressure

Post-intervention. The mixed ANOVA revealed a significant effect for time, $F(1, 22) = 15.48$, $p < .001$, $\eta p^2 = .41$, and time-group interaction, $F(1, 22) = 5.20$, $p < .03$, $\eta p^2 = .19$. Based on Bonferroni adjustment pairwise comparison, participants in the experimental intervention (REBT) group reported improved ($p < .001$, $\eta p^2 = .49$) performance under pressure from pre-test ($M = 0.38$, SD = 0.07) to post-test ($M = 0.55$, SD = 0.14), whereas participants in the placebo control group reported no change ($p = .25$) from pre-test ($M = 0.41$, SD = 0.03) to post-test ($M = 0.46$, SD = .07). In addition, there was a significant difference between the experimental group ($M = 0.55$, SD = 0.14) and the placebo control group ($M = 0.46$, SD = 0.07) at post-test based on Bonferroni adjustment test ($p < .05$, $\eta p^2 = .18$), which was not significant at pre-test ($p = .19$).

Follow-up. The mixed ANOVA revealed a significant effect for time, $F(1, 22) = 14.22$, $p < .001$, $\eta p^2 = .39$, and group, $F(1, 22) = 16.29$, $p < .001$, $\eta p^2 = .42$. Pairwise comparison based in Bonferroni test showed that there was significant decrease ($p < .01$, $\eta p^2 = .36$) in the placebo control group from post-test ($M = 0.46$, SD = 0.07) to follow-up ($M = 0.33$, SD = 0.07) whereas participants in the experimental (REBT) group reported no change ($p = .08$) from post-test ($M = 0.55$, SD = 0.14) to follow-up ($M = 0.49$, SD = 0.07). In addition, there was a significant difference between experimental group ($M = 0.49$, SD = 0.07) and placebo control group ($M = 0.33$, SD = 0.07) at follow-up based on Bonferroni adjustment test ($p < .001$, $\eta p^2 = .18$).

Social validation

Social validation was assessed via brief questionnaires on completion of the study. When asked to rate the importance of a performance improvement, the average response from the participants was 6.3 (out of a possible score of 7). Similarly, positive responses were obtained when participants rated how significant an improvement in performance was to them. On average, the participants' average response was 6.5 (out of a possible score of 7). The responses for the final two questions (satisfaction with the intervention, and has the intervention proved useful) suggested overwhelming support for the perceived efficacy of the intervention with average ratings of 6.4 and 6.75 respectively (out of a possible score of 7).

Discussion

The chief aim of the present study was to examine the effects of a 10-session group-based REBT programme on the performance under pressure, irrational beliefs and social anxiety of U-17 adolescent soccer players. It was hypothesised that REBT could reduce irrational beliefs and social anxiety, in line with past research (e.g., Turner et al., 2020), and enhance

performance under pressure. The findings indicate that the REBT programme brought about significant, meaningful reductions in irrational beliefs and social anxiety, and significant and meaningful increases in performance under pressure, at the post-intervention and four-month follow-up timepoints (as per *p* and *ηp2* values). That is, compared to a placebo control group, participants receiving REBT reported reduced irrational beliefs and social anxiety, and demonstrated improved performance under pressure. These positive changes persisted for four months after the intervention finished as indicated in the follow-up test. Confidence in the findings is enhanced by the use of an RCT design with its random assignment of participants to either the REBT (experimental) or placebo control (soccer technology videos) group, and the social validation of the results, which confirmed subjectively what the data indicated objectively. In the RCT design used in the current study, the only difference between the experimental (REBT) and placebo (videos) control groups is the differential receipt of treatment. In this way, the effects of the different treatments on the output variables are made clear (Kendall, 2003). The use of an RCT design and the application of 10 REBT sessions extends research methodologically by adopting a more rigorous design than is typical in REBT research and by using a greater dose of REBT than is typically reported (see Jordana et al., 2020, for a fuller discussion).

The present study contributes to the existing literature by offering additional support for the use of REBT to reduce irrational beliefs in athletes, particularly in soccer (e.g., Turner et al., 2015). Indeed, the current study adds to our understanding of the application of REBT in soccer, which has been reported in past literature (Barker, 2018; Turner et al., 2014, 2015; Wood et al., 2018). Specifically, it appears that single-session group-based REBT interventions (e.g., Turner et al., 2014) are not as effective in bringing about irrational belief reduction as REBT interventions that include more than one session (e.g., Turner et al., 2015). The present study attests to the utility of longer duration group REBT, with 10 sessions leading to immediate and longer-term positive effects. Furthermore, our findings are consistent with previous studies that report the ameliorating effects of REBT on the social anxiety of athletes (Turner et al., 2020), which more broadly adds to the literature indicating REBT to be an effective intervention to help athletes reduce competitive anxiety (Jordana et al., 2020).

The finding that reductions in irrational beliefs occurred alongside reductions in social anxiety and enhancements in performance under pressure presents some evidence for the potential importance of irrational beliefs for skill execution under pressure. To be clear, in REBT it is the irrational beliefs that are forthrightly addressed as a chief goal, and subsequent changes in other variables (social anxiety and performance) take place due to changes in irrational beliefs. In other words, the REBT intervention did not directly address social anxiety or performance under pressure, but it did directly address (weaken) irrational beliefs. Thus, the athlete is encouraged to adopt a rational position, which functions to alleviate social anxiety. The links between irrational beliefs, anxiety, and pressured performance have been proffered in past research, namely Mesagno et al. (2020), who indicated that irrational beliefs were damaging to pressurised performance under conditions of high anxiety. In addition, Turner et al. (2018) showed that irrational self-talk was not as effective as rational self-talk in aiding golf putting performance under pressure. Therefore, whilst there is still debate concerning the role of irrational beliefs in athletic performance, the current paper indicates that by weakening irrational beliefs, performance under pressure may be aided.

The mechanisms through which pressured performance could be aided via REBT are thought to be centred around greater emotional control (e.g., Sille et al., 2020; Wood et al., 2018) and in particular, reductions in anxiety (Mesagno et al., 2020). In REBT, athletes are encouraged to first understand that they can shape their emotional responding to anxiety-provoking situations via education concerning the GABCDE framework. By learning that emotions are constructed through cognitive mediation, individuals can better apply adaptive emotion regulation strategies such as cognitive control (Gross, 2015) and are less likely to be emotionally reactive to events (Turner et al., 2020). In line with the notion that irrational beliefs form part of the cognitive appraisal process that generates emotion (Lazarus, 1991; Meijen et al., 2020), athletes then learn to challenge beliefs that exacerbate anxiety, and develop beliefs that aid regulation of anxiety. By learning to approach pressure situation with beliefs such as "I want to succeed in this important situation, but that does not mean that I have to" (rational belief) rather than "because I want to succeed in this important situation, that means that I have to" (irrational beliefs), athletes are able to regulate their anxiety, or are more able to view anxiety as facilitative for performance (Chadha et al., 2019). Therefore, the enhancement in performance under pressure as a result of REBT could be a result of greater emotional control, reflected in reductions of anxiety in the current study.

Amidst the adversity that punctuates the soccer context, helping soccer players to weaken their irrational beliefs and strengthen their rational beliefs appears to be a potentially effective strategy for anxiety reduction and pressured-performance enhancement. By imbuing players with the skills to choose what beliefs to challenge and endorse, psychologists can help athletes to approach and react to the litany of trials and tribulations they will face in their careers (Turner, 2016). It is especially important for young soccer players playing in soccer academies to reduce irrational ideologies, as this will be help them choose proper actions to advance their goals, amidst the win-at-all-costs mentality that pervades sport (King et al., 2022; Parry et al., 2007; Watson & White, 2007).

Whilst the current study contains some strengths, such as the use of an RCT design, the application of 10 REBT sessions, and the objective measure of performance under pressure, there are some limitations that must be considered. We attempted to recruit a representative sample of the active soccer players population in Iran, though the number of participants may still be considered small, and a larger sample may provide a more robust and generalisable examination of REBT within soccer. It is recommended that future studies use a larger sample size, and perhaps draw athletes from a variety of sports other than soccer. Also, rather than assess performance under pressure using a specific test, future researchers could assess actual soccer performance to understand how the effects of REBT on performance under pressure play out in real matches. This could provide further external validity to the results. Finally, a cross-over design could be applied, so that those in the placebo control group also receive the REBT intervention, but at a later date. If effects were repeated, then greater confidence in the results could be held.

Applied recommendations

Limitations notwithstanding, there are some clear practical implications that can be garnered from the present study. In the interest of helping academy soccer players to

manage their social anxiety and aid their performance under pressure, practitioners should consider applying REBT. Based on the present study, practitioners could introduce a group education REBT programme into the academy player development process. Or, drawing on extant research, one-to-one REBT support could be offered to players. In either case, it seems that helping players to challenge their irrational performance beliefs is an effective way to help them manage their emotions and may also bestow some performance benefits, especially when they are under psychological pressure. Challenges to practitioners may come from resource poor academies who cannot commit to protracted sport psychology work, thus making 10 REBT sessions difficult to achieve. Thus, practitioners in these circumstances should look to synthesise REBT content to be most impactful for the context they work within, and there is evidence that three sessions can be effectives in reducing irrational beliefs in soccer players (Turner et al., 2015).

Conclusions

In summary, the current study used an RCT design to examine the effectiveness of an REBT intervention upon the irrational beliefs, social anxiety, and performance under pressure of U-17 academy soccer players in Iran. This seldom researched population reported reduced irrational beliefs and social anxiety, and demonstrated increased performance under pressure, following REBT. In addition, and as far as we know, the present study is the only study that has examined the effects of REBT on athletes using an RCT design with the inclusion of a placebo control group. The present paper contributes to the growing research reporting the application of REBT in sport, and in particular, offers support for group-based REBT for use with academy soccer players.

Data sharing policy

The authors agree to make data and materials supporting the results or analyses presented in the paper available uponreasonable request.

Disclosure statement

No potential conflict of interest was reported by the author(s).

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