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Examining the Effects Rational Emotive Behaviour Therapy (REBT) with Embedded Athlete Rational Resilience Credo (ARRC) on the Irrational Beliefs, Motivation Regulation, and Mental Health in Student-Athletes

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Abstract

The use of rational emotive behavior therapy (REBT) in sport psychology is growing, and the use of the REBT-derived athlete rational resilience credo (ARRC) has been reported as an effective tool for use within REBT. The present study adds to the extant literature by examining the utility of REBT and the ARRC in reducing irrational beliefs, enhancing self-determined motivation, and mental health in student-athletes. Participants were three amateur student-athletes (two females and one male; $M = 28.6$, $SD = 5.56$; age range 21–34) engaged in basketball, badminton, and kickboxing. Using an idiographic single-case design, participants completed psychometric measures (IPBI, SMS-II, and MHI) at baseline, post-intervention, and follow-up. The student-athletes received REBT and were encouraged to produce their own ARRC. Visual analyses revealed reductions in irrational beliefs, improved self-determined motivation, and mental health in all three cases. The current study extends emerging REBT research by advancing the understanding of how REBT and the ARRC can be used to bolster self-determined motivation and mental health. The findings may inform sport psychology practitioners seeking strategies to enhance motivation, rationality, and mental health in this population. The use of single-case design and small sample size, limit the generalizability of the study. However, despite limitations this study explicitly demonstrates the potential of employing REBT in conjunction with ARRC for student-athletes. Future research should focus on larger more diverse athlete populations and potentially employ a longitudinal approach to examine sustained outcomes.

Keywords REBT · Athlete rational resilience credo · Self-determination theory · Mental health

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Introduction

The concept of a dual career in student-athletes is understood as the simultaneous engagement in athletic performance and educational or occupational undertakings (Stambulova et al., 2015). Student-athletes are faced with many pressures associated with their 'dual career' (DC), in which they are required to balance the rigorous demands of both an academic and athletic life (Vidal-Vilaplana et al., 2022). These demands may often lead to significant physical and mental health implications due to time constraints, performance expectations, and the need to maintain high levels of physical and mental endurance (Lopes Dos Santos et al., 2020). The pressure for student-athletes to perform at optimal levels in their respective sports, achieve high grades in their studies, and have a balanced social life can be very demanding (Stambulova et al., 2015), and with the mounting pressure place upon them this can lead to increased anxiety, depression, burnout and drop out (Stambulova & Wylleman, 2019). There are documented health risks associated with being a part of this population (i.e., Brand et al., 2013; Pinkerton et al., 1989), because of a student-athletes' typical age, propensity to injury, time demands faced, and regimented schedules, they are at particular risk of mental ill-health (Bissett & Tamminen, 2022). Indeed, according to Weber et al. (2023), there is a 12.5% risk of anxiety and 22.3% risk of depression in student-athletes, compared with non-athlete students', 17% for depression and 22.3% for anxiety. The perpetual need to meet performance goals, fear of failure, and self-depreciation can exacerbate these mental health issues (Sagar et al., 2011; Taylor et al., 2023). Consequently, student-athletes may feel isolated from their peers due to their demanding schedules and limited social interactions. As such examining student-athletes' mental health may allow us to understand how these issues affect their well-being, academic and athletic success, and how we can help them overcome these issues. Due to the 'dual' demands of being a student and an athlete (e.g., academic pressures and performance pressures), this may increase the psychological, social and financial pressures they face. Therefore, elevate the risk of decreased psychological well-being compared to non-athlete students (Kegelaers et al., 2022).

Many student-athletes will not seek help or support for any psychological performance-based problems and mental health issues, due to the stigma around mental health issues (e.g., Schwenk, 2000; Tabet et al., 2021). Giovannetti et al. (2019) study found that stress and pressure were the most common factors affecting mental health, with 47% of the participants indicating that they thought about seeking support for their mental health, but they never did. Furthermore, some student-athletes may have limited access to psychological support and mental health resources that are pertinent to their specific needs. If the issues are not addressed appropriately, then this may lead to consequences such as declines in performance, chronic anxiety and depression, dropping out of sport and their studies, reduction in their quality of life, self-esteem, and emotional well-being (Taylor et al., 2023). As such, exploring the mental health of student athletes is vital to creating effective interventions that allow them to thrive in both areas of their lives. The DC, while rewarding, brings challenges that increase the risk of mental health issues and without intervention, the consequences can have a detrimental impact on their lives. Thus, finding ways in which student-athletes can be supported psychologically as they pursue their DC is of utmost impor-

tance. Past research has indicated a variety of potential psychological risk factors for mental health in student-athlete populations. For example, performance pressure (Rice et al., 2016), injury and recovery (Walker et al., 2007), balancing roles (Sun et al., 2023), overtraining (Cadegiani, 2020), and social identity and isolation (Thomas et al., 2017).

Another risk factor that has emerged in the literature is irrational beliefs as codified within rational emotive behavior therapy (REBT). Irrational beliefs are illogical, rigid and extreme assessments of the self, others, or the world, that may lead to maladaptive emotional and behavioral outcomes (Ellis, 1994; Dryden, 2016). For instance, Turner et al.'s (2022) study discovered that high levels of irrational beliefs were associated with greater psychological distress, including anxiety and depression. As such, amplifying the importance of addressing these beliefs to improve mental health outcomes in student-athletes. Research by Kara et al. (2023) examined the effects of a REBT group counseling program on competitive anxiety and the irrational beliefs of student-athletes. The outcome of this study revealed a significant reduction in irrational beliefs and competitive anxiety, demonstrating the damaging impact of these beliefs on mental health and REBT effectiveness in mitigating them. Furthermore, irrational beliefs negatively impact academic and athletic performance, including maladaptive consequences that impact the student-athletes life. Athletes and humans in general have an innate tendency to develop both irrational and rational beliefs, which can have a significant impact their mental health and performance (Everson & Terjesen, 2023).

It has been proposed that a potential reason why irrational beliefs are problematic for mental health in student-athletes is due to the association irrational beliefs have with motivation regulation. Self-determined motivation refers to the extent to which an individual's behavior is voluntary and self-endorsed, ranging from autonomous forms (intrinsic, integrated, identified) to controlled forms (introjected, external) and amotivation (Deci & Ryan, 1985; Ryan & Deci, 2000). Specifically, it has been suggested that greater endorsement of irrational beliefs is associated with less self-determined motivation (i.e., less autonomous and more controlled regulation; Turner, 2016a), a hypothesis supported by some research findings from athlete (Davis & Turner, 2020), working (Turner et al., 2023), and student-athlete (e.g., Turner et al., 2022) populations. Indeed, research has also applied REBT with athlete populations in order to reduce irrational beliefs, and subsequently, increase self-determined motivation (Chrysidis et al., 2020; Turner & Davis, 2019; Wood et al., 2020). As part of self-determination meta theory (SDT; Deci & Ryan, 1985), organismic integration theory (OIT; Ryan & Deci, 2000) categorizes motivation across a continuum of six regulations, being intrinsic, integrated, identified, introjected, external and amotivation. Intrinsic, integrated and identified motivation are considered autonomous regulations, being driven by internal reward. Conversely, introjected and external regulations are considered controlled forms of motivation, being driven by external rewards (Howard et al., 2020). Amotivation is the complete lack of intention to enact a behavior (Ryan & Deci, 2000).

Turner and colleagues (2022) have evidenced that within student-athletes, irrational beliefs and controlled forms of motivation are likely to co-occur, serving to negatively influence mental health. On the contrary, low levels of irrational beliefs

are likely to co-occur with more autonomous forms of motivation, being adaptive for mental health. Despite the theoretical link between irrational beliefs and self-determined motivation (Turner, 2016a), and some early findings that support this association, research is scant. In fact, to date no published studies have applied REBT within student-athletes to help reduce irrational beliefs, improve self-determined motivation, and improve mental health symptomology. Therefore, in the present study, we apply REBT with student-athletes and measure changes in irrational beliefs, self-determined motivation, and mental health symptomology.

REBT is a humanistic cognitive behavioral counselling approach based on the notion that our beliefs about ourselves, others, and the world, underpin emotional and behavioral functionality (Ellis & Dryden, 1997). It is proposed and supported in research that an individuals' beliefs mediate perceptions of an event and the subsequent emotional and behavioral response (Ellis & Dryden, 1997). REBT proposes that irrational beliefs underpin dysfunctional emotions and behaviors (e.g., anxiety, avoidance), whilst rational beliefs underpin functional emotions and behaviors (e.g., concern, approach; Turner, 2022). In athletes, irrational beliefs have been shown to be related to poorer mental health markers (e.g., depression; Turner et al., 2019), increased burnout (Turner & Moore, 2016), and poorer performance under pressure (Mesagno et al., 2020). As such, the chief goal of REBT is to help people weaken their irrational beliefs, and strengthen their rational beliefs (Ellis, 1994).

In REBT, there are four core irrational beliefs (Ellis, 1994; Turner, 2022); demandingness (e.g., 'I want to therefore I must'), awfulizing (e.g., 'It is terrible if I do not perform well'), frustration intolerance (e.g., 'I cannot stand it I don't perform well') and depreciation (e.g., 'I am worthless if I do not perform well'). These beliefs are rigid (i.e., absolute in nature), extreme and illogical (i.e., the belief is not consistent with reality). On the other hand, rational beliefs include preference (e.g., 'I want to, but that does not mean that I have to'), anti-awfulizing (e.g., 'it might be bad, but it is not terrible if I do not'), frustration tolerance (e.g., 'it is tough, but I can stand it if I do not') and unconditional acceptance (e.g., 'not succeeding does not mean I am worthless, it simply shows that I am fallible human being'). Rational beliefs are flexible (i.e., not absolute in nature), non-extreme, and logical (i.e., consistent with reality). This difference in flexibility, extremeness and logic positively influences the functionality of emotional and behavioral consequences.

Evidence indicates that REBT successfully reduces irrational beliefs in athletes (see Jordana et al., 2020, for a review). Extant research also demonstrates that REBT can reduce anxiety (Turner et al., 2020) and increase resilient qualities (Deen et al., 2017), self-efficacy (Chrysidis et al., 2020), self-determined motivation (Davis & Turner, 2020), and motor performance (Wood et al., 2018). REBT has also been shown to be effective in helping referees reduce anxiety, improve decision making, enhance performance (Maxwell-Keys et al., 2022), and enhance the mental wellbeing of coaches (Bailey & Turner, 2023).

The process through which REBT is applied is guided by the GABCDE framework. Goal (G) relevant and incongruent adversities (A, e.g., an important competition) are believed to have emotional and behavioral consequences (C, e.g., the competition is making me anxious). Though, irrational beliefs (B, "it's terrible if I perform poorly") underpin these consequences (C), and as such, are disputed and

weakened (D). From this disputation, effective new rational beliefs are developed and strengthened (E). These new effective rational beliefs are then imbedded, promoting functional emotions and adaptive behaviors. One common rational alternative endorsed within REBT is Unconditional Self-Acceptance (USA; Knapp et al., 2023; Outar et al., 2018). USA is the full, unconditional acceptance of oneself, irrespective of behaviour, or the (dis)approval and (dis)respect of others (Chamberlain & Haaga, 2001). Whilst REBT does not necessarily aim to influence the valence of one's affect (i.e., one's mood), one can see how improvements in USA can improve an individuals' mood. If no one can influence my self-esteem, there is less chance that my mood can be influenced by others, and as a result, affect is likely to be improved. This may be so, as Wood et al. (2017) called for research on the efficacy of REBT on improving affect. Hence, the present research aims to adopt an innovative mode of REBT by examining the influence of ARRC-embedded REBT on the mental health (including affect) of student-athletes.

In REBT literature, researchers have encouraged the use of the Athlete Rational Resilience Credo (ARRC) in complementing REBT (Turner, 2016b) as a way to negate irrational beliefs and bolster rational beliefs. Specifically, a credo is an individually tailored set of beliefs that influence the way people live (Dryden, 2007), typically reflecting rational beliefs and adaptive consequences. For example, a student-athletes credo may include statements such as, 'my performances do not determine my worth as a person, I want to succeed, but I accept that mistakes are lessons that enable growth'. Such personalized affirmations help imbed the GABCDE process, used to supplement REBT (e.g., Deen et al., 2017; Dryden, 2009). Aptly named a 'resilience' credo, Dryden (2007) proposed symmetry between REBT and the concept of resilience. Those who respond adaptively to adversity are likely to hold rational beliefs as opposed to those who hold irrational beliefs. Though here we do not regard resilience as an ability to 'bounce back' effortlessly, but rather to acknowledge emotional distress as part of the process of becoming resilient (Sarkar et al., 2015), without catastrophizing beliefs in the process (Fletcher & Sarkar, 2012). REBT is an approach that minimizes this catastrophic thinking by challenging counterproductive beliefs, and a ARRC is a tool that can bolster the efficacy of REBT (Deen et al., 2017). Contextualizing credos to sport and exercise settings, Turner (2016b) developed the Athlete Rational Resilience Credo (ARRC). The ARRC promotes the ideal resilient response to adversity. Beliefs about adversity can be in reference to achievement (i.e., I want to succeed), fairness and respect (i.e., I want to be respected by others), as well as approval (i.e., I want to be approved by others) and opportunities (i.e., I want to be given opportunities to improve). The ARRC is a set of beliefs that; (1) reinforce preferences to negate rigid demands (i.e., the primary rational belief), (2) reinforce anti-awfulizing, frustration tolerance, acceptance of self and others (secondary irrational beliefs), (3) and also promotes rational adherence to the ARRC. Initial investigations incorporating the ARRC within the REBT process in sport has proven efficacious in decreasing irrational beliefs, and improving resilient qualities (Deen et al., 2017), but research is in its infancy.

Current Study

In the current study, we advance the research into the convergence between REBT and SDT by applying ARRC-embedded REBT with student-athletes and assessing pre-post irrational beliefs, motivation regulation, and mental health (i.e., Anxiety, Depression, Behavioral Control, and Positive Affect). The ARRC can be an effective instrument to help individuals develop rational beliefs and improve wellbeing if implemented appropriately. Nonetheless, the ARRC is not a full solution for irrational beliefs, but can increase the rate and depth at which an athlete is able to replace irrational beliefs with rational beliefs (Turner, 2016b). This can be done by ensuring the credo is updated by the student-athlete regularly, removing ineffective or less relevant segments, and replacing them with appropriate content (i.e., emotional, cognitive and behavioural). From the use of an ARRC, an individual is provided with the 'tools' to adapt to adversities they may encounter, hopefully seeing them as challenges and opportunities to develop as a person (Deen et al., 2017; Turner, 2016b). During the therapeutic process, athletes take ownership and develop their own credos, adapting and 'fine-tuning' the credo as time goes on, allowing them to take more responsibility for the changes that occur (Dryden, 2016). At present, there is no research that highlights the efficacy of ARRC-embedded REBT with student-athletes on irrational beliefs, motivation regulation, and mental health. Also, past research that has investigated the effects of ARRC-embedded REBT have not provided detail into the ARRC's that participants have constructed. In the present paper, the process of developing the ARRC is included for each participants to provide important applied and procedural information. Taking together existing research (Davis & Turner, 2020; Deen et al., 2017; Turner et al., 2022), it is hypothesized that ARRC-embedded REBT will reduce irrational beliefs, anxiety, and depression, and improve self-determined motivation regulation, behavioral control, and positive affect, in a sample of student-athletes in the United Kingdom (U.K.).

Methods

Participants

Following institutional ethical approval from Staffordshire university ethics committee, participants provided informed consent and were recruited via convenience sampling. Three student-athletes in their second year studying on a foundation degree in sports coaching in the U.K. agreed to participate in the study (2 female and 1 male; $M=28.6$, $SD=5.56$), being typical of a single-case approach in REBT (e.g., Deen et al., 2017; Turner et al., 2020). The student-athletes were recruited by the first author from a sport coaching degree cohort of twelve students. These participants were selected through a screening process, whereby all three participants reported to have the propensity for irrational beliefs. Specifically, participants reported baseline scores of 3.89, 3.29, and 3.86 respectively on the irrational performance beliefs inventory (iPBI; Turner et al., 2018), and with possible iPBI scores ranging from 1 to 5, all three participants revealed sufficiently high levels of irrational beliefs to war-

rant REBT (Turner et al., 2018). All participants engaged in competitive sport (i.e., basketball, badminton and kickboxing) at an amateur level and had not received any sport psychology support before the intervention.

Design

Replicating previous research, the present study utilized an idiographic single-case pre–post design with mid- and follow-up assessments approach (e.g., Deen et al., 2017). To reflect an idiographic investigation, participants received an intervention which varied in mean session length due to participant time needs, with sessions lasting on average for 30 min. We used a staggered baseline approach, as used in previous research (Deen et al., 2017). Following convention, we report the outcome of the intervention for each participant individually (Voight, 2012). Data were collected over a 11-week period from baseline (weeks 1 to 4) through to post-intervention phases (weeks 8 to 11) and follow-up four months post-intervention. The intervention was structured such that the baseline phase involved discussing initial information on REBT and ARRC, the intervention phase consisted of weekly REBT sessions, and ARRC development and the follow-up phase entailed monitoring without any active intervention. Participants were required to complete all psychometrics (i.e., IPBI, SMS-II and MHI) at baseline (i.e., a single timepoint), post intervention, and at a four month follow up. To mitigate potential respondent fatigue associated with the use of multiple scales with a high total item count, assessments were kept within a manageable duration, short breaks were permitted as needed, and the order of scales were counterbalanced across participants to reduce tedious effects.

Measures

Irrational beliefs The irrational Performance Beliefs Inventory (iPBI) was used as contextually-specific measure of irrational beliefs in performance environments, such as education and sport (Turner et al., 2018). The iPBI measures the four core irrational beliefs demandingness (DEM), awfulizing (AWF), frustration intolerance (FI) and depreciation (DEP), each consisting of seven items. Each item is rated on a 5-point Likert-scale ranging from 1 (*Strongly disagree*) to 5 (*Strongly agree*). Composite irrational beliefs are determined by summing all scores and dividing by 28 (number of items). Higher scores indicate greater endorsement of irrational beliefs. The iPBI has demonstrated good predictive, concurrent, construct validity (Turner et al., 2018). Like previous research, composite irrational beliefs are used for analyses (Deen et al., 2017; Turner et al., 2022).

Self-determined motivation The Sport Motivation Scale-II (SMS-II) is a 28-item measuring six forms of behavioural regulations, which include: (1) amotivation (2) external regulation (3) introjected regulation, (4) identified regulation, (5) Integrated regulation, and (6) intrinsic motivation. Each item is rated on a 7-point Likert-scale ranging from 1 (*does not correspond at all*) to 7 (*corresponds exactly*; Pelletier et al., 1995). The SMS-II has demonstrated good factor structure (RMSEA = 0.05; CFI = 0.93; TLI = 0.91), and good Cronbach's alpha coefficients (from 0.70 to 0.88; Pelletier et al., 2013; Davis & Turner, 2020). Using the method defined by Vallerand

(2001), each subscale of the SMS-II was multiplied by an ascribed weight, according to its position on the OIT (e.g., Davis & Turner, 2020). The scores were then calculated to form a self-determination index (SDI), which is also referred to as the relative autonomy index (RAI; Intrinsic (15*3) + Integrated (18*2) + Identified (16*1) + Introjected (12*−1) + External (12*−2) + Amotivation (6*−3), in which lower scores are regarded as less self-determined (or controlling) motivation and higher score representing more self-determined (or autonomous) motivation. Typical of research within REBT (e.g., Chrysidis et al., 2020; Davis & Turner, 2020) the SDI has been used in this way with athletes, and student-athletes (Turner et al., 2022) and has the advantage of concise data reporting due to reduced variables in data analysis (Davis & Turner, 2020).

Mental health The Mental Health Inventory (MHI-18) has 4 subscales (Anxiety, Depression, Behavioral Control, and Positive Affect), and one total score. The subscale and total scores range from 0 to 100, with higher scores indicating adaptive mental health. Each item is scored on a 6-point Likert-scale ranging from 1 (*all of the time)* to 6 (*None of the time*). The MHI is a validated measure of positive and negative mental health (Meybodi et al., 2011) used in research with athlete populations (Nezhad et al., 2010). Internal consistency for the MHI-18 has been found to be excellent (Meybodi et al., 2011; Nezhad et al., 2010).

Social Validation

Social validation data were collected post-intervention. These data help to understand the quantitative results, and the efficacy of the intervention from the participants' perspective (Page & Thelwell, 2013). Replicating Deen et al. (2017), participants were asked about the usefulness of the intervention in influencing their beliefs, motivation, and mental health.

Intervention

The ARRC-REBT (ARC embedded REBT) intervention was delivered by the first author, under the supervision of the second and third authors who are Health and Care Professions Council registered practitioner psychologists, and qualified practitioners in REBT (i.e., primary and advanced practitioners). To minimize any potential observer bias arising, standardized intervention protocols and validated psychometric measures (e.g. Deen et al.) were employed to ensure objectivity. Moreover, outcomes were evaluated using established visual analysis procedures rather than subjective interpretation. Each session was conducted on a weekly basis and was arranged individually with the participants at a convenient time and location (e.g., after class in available classrooms, sports hall, and gym). Following this, participants received a brief overview and introduction to REBT and more specifically, the ARRC. As recommended (Turner, 2016b), in the third week of the intervention, the development of the individualized ARRC was initiated on a 1–2-1 (individual) basis. During these 1–2-1 sessions each participant was guided to step-by-step to develop their credo using the ARRC (Turner, 2016b) as a template to work from. From this, the student-athletes were encouraged to use their own language and express their own thoughts and feel-

ings honestly regarding their primary and secondary rational beliefs. For example, the participants were asked to reflect on areas such as, their achievements, consistent performances, development, respectful/fair treatment, acceptance/approval from others, and opportunities (Turner, 2016b). This individualized approach ensured that each credo was personally meaningful and relevant, whilst also giving participants the opportunity to ask questions, clarify concepts and receive feedback. For the credo to be effective, the participants are required understand the basic core principles of REBT, and structure their credo appropriately. As such, the participants were guided through different stages. (1) develop an understanding of rational thinking and how it could be beneficial to them, (2) identify any irrational thoughts that may affect their performances, (3) consider how they can weaken irrational beliefs and strengthen rational beliefs, (4), record their rational beliefs in a personal statement, and therefore form the foundation of their ARRC, (5) regularly read and review their credo. The intervention consisted of four, weekly sessions lasting between 27 and 36 min. Participant 1's REBT lasted 145 min, participant 2's REBT lasted 108 min, and participant 3's REBT lasted 130 min. Participants 1 and 3 also attended the follow-up session for 28 and 29 min respectively, and received 3 and 2 additional support emails respectively.

In session one participants were educated in the use of the GABCDE framework central to REBT (Turner, 2022). Participants applied experiences from past events in their life, to raise their awareness of various adversities (A) to their goals (G), and the subsequent consequences (C). The education also allowed participants to understand how their beliefs (B) about adversity (A) can determine the functionality of their emotional and behavioral responses (C). Following this, participants were familiarized with the four core irrational beliefs. After session one and after participants learned about the GABC framework, the following session was focused on participants challenging and cognitively restructuring (D) their own irrational beliefs they held about recent and/or pertinent challenges that they had encountered. Following this, participants were encouraged to dispute and replace their irrational beliefs with rational alternatives (E). Between sessions participants were asked to complete an ABC diary, making the link between adversities (A), beliefs (B), and healthy and unhealthy negative emotions (C). During sessions three and four, the practitioner worked in collaboration with participants to develop and finalize each of their ARRCs.

The Athlete Rational Resilience Credo's (ARRC)

The practitioner aided the development of the ARRC (guided by Turner, 2016b), structuring the credo in line with the core irrational and rational beliefs of REBT, in a clear and coherent style to ensure the credo was easy to follow. That is, participants were guided to use separate paragraphs for primary and secondary rational beliefs, and encouraged to capture their thoughts in their own lexicon. Participants were then given autonomy in crafting their ARRCs in their own words, whilst being guided to ensure alignment with REBT. Any misunderstandings were discussed, and salient elements within their belief system were emphasized during development. The ARRC can be used in many different ways to encourage the internalization of

rational beliefs. Participants were encouraged to read their ARRC daily in order to internalize it and allow for critical reflection on their irrational/rational thoughts by considering how their credo is pertinent to their specific issues. Participants were monitored to ascertain what elements were being lived and the extent the supported beliefs can truly be adhered to (Turner, 2016b). Towards the end of the ARRC, participants' rational adherence to their adapted ARRC (i.e., "I would like to, but I do not have to, live by this credo") was encouraged (Turner, 2016b). Each participant's ARRC can be seen below, followed by commentary by the authors to help contextualise each ARRC.

Participant 1 ARRC "I have many things that I feel that I need to achieve before I reach a certain age. For me and for my children. I have unintentionally set goals around a time frame. When I started to study sports, this was not something that engulfed my thoughts or actions, but as time has moved forward, it is something that I have pressured myself to do. But now I have been able to think about things differently, it is not "wrong" or "abnormal" to do things "unconventionally" and there are not things I 'must' achieve or it's the end of the world, if I fail or I am treated badly this is bad but not terrible. It is okay for me to have had my children and then seek to find higher education and push to achieve my goals. It is okay for me to be able to study so that I can begin a career that I have passion about. To find a job that will influence and help others and something that I, and my children can be proud of. I must remember to not put too much pressure on myself, and that it is okay to have bad days. Everyone has bad days, but that does not mean that everything else will fail because of it. I have met tough times many times, and I need to remember that things have always been okay in the end and that tough times do not last forever. Feelings of sadness and being upset do not last forever, and that they are healthy and looking back has motivated me to do better. I have at times worked myself up into a frenzy when everything seems to happen at once. But learning to break things down and work through things bit by bit has proved to be the best way that I have been able to pull things back and move forward and succeed. This has proven positive in many aspects of life, and therefore I will try to remember this if things seem to be impossible again. Being able to recognize when things are going to take a turn is an advantage to move forward and prepare myself and prevent, if possible, it from happening, or be in a better position to deal with it.

I used to think that if I was not liked, it was a representation of me. But now I realise that not everyone likes everyone, and that everyone is different and gels differently, so I don't get offended any more. However, I believe that respect is a very different thing, and everyone should be treated with respect unless there is an absolute reason not to be. I believe in good manners, courtesy, and decency and it is how I raise my children, and I do think it is rude when this is not returned, and people are rude if they don't possess these qualities. On the other hand, people have other values, different cultures, and are courteous in other ways. So maybe I should think that people are not annoying or rude if they do not share the same values as me. Moving forward, I write this credo with the intent to follow a more open mind, to motivate me, and to not be so rigid in my thought process of putting pressure on myself, or feeling incredible guilt when I tell myself something, or plan to do something and it hasn't been possible. I am still here, I am becoming more positive about the decisions

I have made and am more flexible in how I think about things. I realise that I will have to remind myself to look back over this credo, it will help me daily to forget the negative thoughts and improve my quality of life."

Commentary on Participant 1's ARRC Here, participant 1's ARRC is adaptive, understanding the futility of previous thought processes and the importance of strengthening their rational beliefs (preferences, anti-awfulizing, high frustration tolerance and unconditional self-acceptance). Participant 1 is using flexible language, not placing absolutistic demands on themselves (i.e., preferences (flexible & non-extreme) *'[I will] not be so rigid in my thought process of putting pressure on myself'*). Participant 1 now acknowledges that emotional distress as part of the process, but that there are healthy and unhealthy ways to respond (i.e., anti-awfulizing and high frustration tolerance '*Feelings of sadness… do not last forever… they are healthy and… have motivated me to do better*'). In addition, the participant now acknowledges that other peoples' feelings and values do not reflect their self-worth (unconditional self-acceptance '*I used to think that if I was not liked*, *it was a representation of me. But now I realize that not everyone likes everyone*, *and that everyone is different and gels differently so I don't get offended any more*').

Participant 2 ARRC "As a student athlete and a human being I have many desires and things I want to achieve. Some of these 'wants" are strong as I am driven to be the best I can possibly be. Yet, I recognize that no matter how compelling my desires are this does not mean that I "have to" or "must" have my desires met. It's okay that I feel dissatisfied when my desires are not met, because I care about all my achievements in life and these feelings will help motivate me to work harder. I understand that when I fail, face obstacles or I am treated badly, this is unfortunate but not terrible or the end of the world, and none of it is actually really that awful. I recognize that I can tolerate being treated unfairly and not be accepted and valued by other people, and not being given opportunities. This might make me feel frustrated and upset and affect my ability to achieve my goals, but I am certain I can tolerate failure. This will give me valuable experience to grow as a student, athlete and as a person".

Commentary on Participant 2's ARRC Participant 2 had time constraints and found it difficult to fully engage, so they decided to construct a very short concise credo, to allow themselves to adhere to it with greater ease on a daily basis. Similar to participant 1, participant 2 attempts to incorporate the rational tenants of REBT (preferences, anti-awfulizing, frustration tolerance) and acknowledges and challenges the rigid and illogical nature of demanding (i.e., '*no matter how compelling my desires are this does not mean that I have to*'), awfulizing (i.e., '*I understand that when I fail… this is unfortunate but not… the end of the world'*) and frustration intolerance (i.e., '*I am certain I can tolerate failure'*). Although Participant 2's credo demonstrates effort to develop their rationality, not all rational beliefs are considered, with unconditional self-acceptance not featured in the credo at all.

Participant 3 ARRC "There are many things I desire and want to achieve. Some of these 'wants' are intense as I am determined to be the best I can possibly be. However, I understand that no matter how powerful my desires are this does not mean that I "have to" or "must" have these desires met. I am capable of completing and understanding tasks I feel I need to achieve, but It's okay that I feel dissatisfied when I don't achieve every goal I set first time, because I care about all my achievements in

life and these feeling will help push me to work harder. It's okay that I feel upset and disappointed when my desires are not met, as this shows that I care about my sport and my achievements within it. If I am perceived as bad, this does not mean that I have completely 'failed', it simply means that I require more practice. I understand that when and if I fail, fall on hard times or I am treated poorly, this is unfortunate but not terrible, and not actually really that awful at all. I know that I can tolerate being treated unfairly and not be accepted and valued by other people. This may upset me and make me feel frustrated and possibly affect my ability to be successful, but I am certain I can tolerate failure. I have the ability to make the choices that will help me to succeed not lead me to overall failure. Creating this credo and following it daily will help me become a better person, and I will not belittle myself with negative irrational thoughts; such as I 'must' achieve it would be 'awful' and 'unbearable' if don't achieve; if I fail or people treat me badly I am stupid. I recognize that I want achieve things, but I don't have to and this is not 'awful' or unbearable and I can tolerate failure."

Commentary on Participant 3's ARRC Participant 3's credo demonstrates a logical approach to strengthening rational beliefs. Participant 3 highlights similar perceptions to participant 1 and 2 regarding the rigidity of demands (i.e., '*no matter how powerful my desires are this does not mean that I have to'*), and futility of awfulizing and frustration intolerance (i.e., '*if I fail…this is unfortunate but not terrible*, *and not actual really that awful at all'*). Adding to this, participant 3 evidences that their self-worth is not defined by external sources, and that they are valuable as a human being, regardless of perceptions of others an life events (i.e., '*If I am perceived as bad*, *this does not mean that I have completely 'failed'*, *it simply means that I require more practice*').

Comparing the ARRCs, participant 1 and participant 3's are similarly constructed. Participant 1 has included more real-life context within their credo, which provides rich in-depth detail into the irrational thoughts they experience and the attempt to promote more rationality in their daily lives. Participant 2's is much shorter and does not reflect all rational beliefs. It can be inferred that participant 2 did not fully engage in the ARRC process.

Analytic Strategy

Minor changes in variables can lead to considerable differences for individuals in idiographic case study designs, as such, data were tabulated (Table 1) for each participant (e.g., Davis & Turner, 2020). Visual inspection was conducted on the observed variables for each participant, including irrational beliefs, the self-determination index (i.e., RAI), and mental health (see Table 1). This inspection occurred across four separate time points; baseline, midpoint (midway through using a credo), post-intervention (after using a credo) and follow-up (four-month). The visual analysis of data was informed by guidelines by Hrycaiko and Martin (1996) including four steps to determine intervention effectiveness; (a) immediacy of effect, (b) effects replicated across participants, (c) overlapping data points between baseline and follow-up, (d) and the magnitude of change from baseline to follow-up phases. We also used the Reliable Change Index (RCI; Jacobson & Truax, 1991) which helped to determine

Table 1 Means and percentage change for irrational beliefs, self-determined motivation and mental health across time points

Outcomes	Participant	Base	Mid	Post	FU	Base to Post change (%)	RCI	Post to FU change (%)	Base to Follow-up change (%)	RCI
Irrational beliefs	1	3.89	2.59	1.73	3.78	−56%	**3.52**	114%	−6%	−0.25
	2	3.29	2.20	1.84	–	−46%	**3.93**	–	–	–
	3	3.86	2.97	1.90	2.61	−47%	**5.31**	25%	−33%	**2.83**
RAI	1	51	77	93	46	82%	**3.17**	−51%	−10%	−0.31
	2	52	80	80	–	54%	**2.11**	–	–	–
	3	12	32	71	43	492%	**4.45**	−39%	258%	1.95
Anxiety	1	28	44	64	28	−129%	**5.93**	56%	0%	0.00
	2	35	48	48	–	−39%	**2.14**	–	–	–
	3	48	64	68	71	−42%	**3.30**	4%	48%	**2.68**
Depression	1	50	50	60	65	−20%	1.17	−8%	30%	1.47
	2	50	65	65	–	−30%	1.76	–	–	–
	3	25	55	85	65	−340%	**7.04**	24%	160%	**3.92**
Behavioral control	1	55	60	60	65	9%	0.73	8%	18%	**10.95**
	2	75	80	80	–	6%	0.73	–	–	–
	3	55	40	80	70	45%	**3.64**	−13%	27%	**16.43**
Positive affect	1	35	45	60	50	71%	**3.19**	−17%	43%	1.78
	2	30	55	55	–	83%	**3.19**	–	–	–
	3	55	50	80	75	107%	**3.19**	−6%	36%	**2.38**

RAI relative autonomy index; *FU* follow-up; *RCI* reliable change index

The Bold scores indicate statistically signifcant changes over time

whether the change from baseline to postintervention and follow-up phases were significant and not due to measurement error or natural fluctuations. RCI is calculated by dividing the difference between the pre- and post-test scores by the standard error of the difference (SE_D) between the two scores, this calculation was conducted manually on Microsoft Excel using the Jacobson and Truax (1991) formula. An RCI value greater than 1.96 indicates a significant change at the 95% confidence level (Jacobson & Truax, 1991).

Results

Visual Analyses

Participant 1 From baseline to post-intervention, visual analysis revealed significant percentage changes in irrational beliefs (−56%), self-determined motivation (+82%), anxiety (−129%, anxiety reduced by more than 100% relative to baseline), and positive affect (+71%), and non-significant changes in depression (−20%) and behavioral control (+9%). From post-intervention to follow-up there was an increase in irrational beliefs (+114%), anxiety (+56%), and depression (+8%), and a decrease in

positive affect (−17%) and self-determined motivation (−51%). However, behavioral control continued to increase from post intervention to follow up (+8%). From baseline to follow-up, only behavioral control showed a significant increase (+18%). For participant 1 the intervention may have acutely improved multiple target variables, but effects were not maintained at the 4-month follow-up.

Participant 2 From baseline to post-intervention, visual analysis revealed significant changes in irrational beliefs (−46%), self-determined motivation (+54%), anxiety (−37%), and positive affect (+83%), and non-significant changes in depression (−30%) and behavioral control (+6%). No follow up data was collected from participant 2 due to availability of the participant at this point in time. But results indicate that the intervention may have acutely improved multiple target variables.

Participant 3 From baseline to post-intervention, visual analysis revealed significant changes in irrational beliefs (−47%), self-determined motivation (+492%), anxiety (−42%), depression (−340%), behavioral control (+45%), and positive affect (+107%). From post-intervention to follow-up, although scores moved towards back to baseline or remained stable, there was not a return to baseline like what was observed in participant 1. From baseline to follow-up, there was a significant change in irrational beliefs (−33%), anxiety (+48%), depression (+160%), behavioral control (+27%), and positive affect (+36%). There was a non-significant change in self-determined motivation (+258%), but the RCI value was 1.95 which is 0.01 lower than what would be considered a significant change. For participant 3 the intervention may have acutely improved multiple target variables, and although there was some movement towards baseline, results were maintained at the 4-month follow-up.

Discussion

The present study is the first to examine the effects of ARRC-embedded REBT in a student-athletes sample. Previous research has not specifically examined the integration of ARRC within REBT for student-athletes. Although REBT interventions have been applied across athletic populations (e.g., Turner & Davis, 2019; Wood et al., 2020; Chrysidis et al., 2020) and ARRC has been tested in broader athlete contexts (e.g., Deen et al., 2017), a focused investigation in student-athletes has not been reported. To mark the pre-post effects of the ARRC-REBT, we measured irrational beliefs, motivation regulation, affect, behavioral control, anxiety and depression (mental health). We hypothesized that ARRC-REBT would reduce irrational beliefs, anxiety, and depression, and improve self-determined motivation regulation, behavioral control, and positive affect. Results indicate that there were short-term improvements (from baseline to post-intervention) in irrational beliefs, self-determined motivation, positive affect, behavioral control, anxiety, and depression. These findings are in support of previous ARRC research (e.g., Deen et al., 2017), but also of broader REBT literature (e.g., Jordana et al., 2020).

Results are perhaps unsurprising. With the ARRC being advocated for use with athletes (Turner, 2016b), it can also be postulated that student-athletes may benefit from ARRC-REBT. The positive effects of ARRC-REBT found in the present paper might be explained in various ways. During the ARRC-REBT process participants

took ownership of their own ARRCs, which may have supported a greater sense of responsibility for the changes that occur (Dryden, 2016). It may be the case that the freedom to create one's own ARRC provides participants with opportunities to shape their beliefs in a more autonomous way. Perhaps creating their own realistic narrative may have helped inspire and motivate participants towards change in a more personal and meaningful way (Deen, 2017; Dryden, 2007), consequently rehearsing rationality, imbedding such beliefs. Alternatively, the ARRC can be seen as an extension, or supplement, to the effects of REBT. The ARRC is not positioned as a separate intervention to REBT, but as a potential enhancer of client change. Thus, it is possible that the changes observed in the present study may reflect the effects of REBT, with or without the influence of the ARRC. To tease the effects of REBT and the ARRC apart, one must adopt a research design that compares REBT with no ARRC, REBT-ARRC, and ARRC alone. However, it is questionable whether participants would have the necessary knowledge to construct their own ARRC in the absence of any REBT education.

The improvements in self-determined motivation reported in the present paper support the extant research showing that REBT can have a positive effect on motivation regulation (e.g., Davis & Turner, 2020). In addition, previous research has evidenced the associations between irrational beliefs and motivation regulation in student-athletes (Turner et al., 2022). Namely, irrational beliefs are likely to co-exist alongside autonomous motivation regulation, whilst low levels of irrational beliefs are likely to co-exist alongside controlled forms of motivation. The present research adds to the claim that REBT and ARRC for student-athletes were associated with changes in co-existing beliefs and motives, which may lead to positive effects on mental health. Specifically, REBT and ARRC's may encourage logical, evidence-based thoughts on adversity, potentially reducing the inflexible need to enact a behavior. In doing so, the reasons behind an individual's behavior are likely to change. What was once an endeavor to avoid guilt and punishment (i.e., controlled motivation) can now be one that is unfettered, acting because they want to, not because they must (i.e., autonomous motivation). From the results presented, it may be so that one's motivation can be important for the activation of irrational beliefs, and this may become problematic for wellbeing when motivation for behavior is not autonomous (e.g., guilt, avoiding punishment; Davis & Turner, 2020).

Irrational beliefs and poor motivation regulation can present a risk to mental health. As one's rigid, illogical, extreme belief about performance increases ("I am worthless if I don't reach my goals"), and one's motivation to perform is externally driven ("If I don't perform well, my family would be disappointed in me"), risks to mental ill-health increases. If one's behavior does not meet both personal and externally set expectations, feelings of inadequacy are likely to rise. Both self-criticism and fear of criticism from others can leave individuals in a precarious position regarding the stability of their mental health. Indeed, greater self-determined motivation regulation is related to greater psychological and physical health (Ng et al., 2012), and so based on the present paper, it may be potentially advantageous to decrease depression and anxiety symptomatology, and increase positive affect, within student-athletes by applying ARRC-REBT.

Whilst mental health was improved in this study in the short term, these effects were not sustained over time. Continued positive effects were only maintained for one of the three participants (follow up data was not collected for participant two). In fact, for one participant, most of the measured variables returned to, or neared, baseline levels. This could be due to several reasons, such as, adherence to the credo, their perceived effectiveness of the credo, amotivation, life changes, difficulties integrating the credo into daily routine and the support of the first author. It could also be because the dose of ARRC-REBT was insufficient, with previous research indicating a dose-response in athletes (Turner et al., 2015). Furthermore, irrational beliefs and motivation regulation were mostly unchanged from baseline in participant 1 at the four month follow up. On the other hand, there were substantial improvements in all variables at the four month follow up (relative to baseline) for participant 3. The initial intervention was effective at improving anticipated variables in both participants, though the maintenance of these effects is not consistent. Chrysidis and colleagues (2020) identified similar effects to the ones presented in the current paper. In their research, they utilized REBT to improve irrational beliefs, motivation regulation and self-efficacy, and identified that REBT improved irrational beliefs, autonomous motivation regulation, and self-efficacy in the short term. However, at the maintenance phase (1 year post intervention), improvements were inconsistent. Improvements in irrational beliefs, motivation regulation and self-efficacy were maintained in one participant. That said, in the other, improvements in irrational beliefs were minimal. Based on these findings, there is scope for researchers to ensure that the participants can use REBT independently to maximize REBT improvements. Also, the variability in effects speaks to the importance of adopting idiographic research designs in which participants are not grouped, thus offering transparency regarding idiographic effects. Although the observed improvements were not consistently maintained at follow-up, the short-term benefits of ARRC-REBT highlight its potential as a practical tool for sport psychologists. Similar interventions may be useful in competitive periods that require immediate improvements in rational thinking, motivation regulation and mental health. Therefore, practitioners could employ ARRC-REBT as a focused time-limited strategy to support athletes and student-athletes in managing acute psychological demands, whilst also integrating follow up sessions to enhance and maintain the effects.

The findings of the present study are positive the short term, and less consistent in the longer term, and this work is not without its limitations. The main limitation of this current paper is the absence of follow-up data from participant 2. This absence means that our conclusions about the longer-term effects of ARRC-REBT on the measured variables is incomplete with regards to the participants involved in this study. However, the missing data does reflect an important feature of applied research, in that not all participants will engage equally, and not all participants will adhere to the data collection schedule. In single-case designs, any absence of data will affect the total quantity of data significantly because less participants are present. However, researchers and practitioners should work to ensure maximal participant engagement in all aspects of the intervention and data collection.

Whilst it is admissible to suggest that ARRC-REBT was associated with changes in irrational beliefs, motivation regulation and mental health, a fuller understanding

is needed on the cause-and-effect relationship between the three and the key mechanisms at play. Whilst recent research has evidenced the co-existence of an association between irrational beliefs and motivation regulation (e.g., Turner et al., 2022), causal relationships between these factors are yet to be determined. Longitudinal and or experimental research is necessary to understand the interact and interplay between irrational beliefs, motivation regulation, and mental health, for example, within the context of a full student-athlete career. Future research should adopt randomised controlled designs (see Nejati et al., 2022, for an example) to compare the effects of ARRC-REBT to those of comparison and placebo conditions.

Whilst an idiographic design was used in the current study, single-case guidelines suggest that 8-weeks of baseline data is to be collected (Barker et al., 2011). Within the present study, a significant baseline phase alongside the intervention could not be accommodated due to the burden on time that this would pose. In addition, although decreases in irrational beliefs appeared to be fruitful for motivation regulation and mental health, we cannot prove whether and what extent participants actually adopted and internalized rational beliefs. Irrational beliefs and rational beliefs are two relatively orthogonal constructs (Turner, 2016a). Recent research has measured the efficacy of REBT on both irrational and rational beliefs. Outar et al. (2018) identified that REBT can both decrease irrational beliefs, and improve rational beliefs, namely, unconditional self-acceptance. Future research within REBT should endeavor to measure and improve both irrational and rational beliefs. Another important element of the current study was the use of an ARRC in complementing the application of REBT (Turner, 2016b). Although we followed Deen and colleagues' (2017) advice on improving understanding of the credo, there was no statistical evidence to suggest that REBT alongside the use of credos was more efficacious than REBT conducted alone. In practice, the ARRC should be *part of* REBT, not a separate intervention, so we must balance research design with practical utility.

In conclusion, the aim of the current study was to examine the effects of ARRC-REBT on the irrational beliefs, self-determined motivation, affect, behavioral control, anxiety, and depression, of student-athletes using an idiographic case-study design. Results indicate that from pre-post ARRC-REBT, participants reported decreases in irrational beliefs, anxiety, and depression, increased self-determined motivation, and improvements in positive affect, and behavioral control, in the short-term. The present study provides support for the use of the ARRC to supplement REBT within a student-athlete sample, but researchers should turn their attention to how these short-term effects can be maintained. Moreover, for applied sport psychology, this intervention may serve as valuable short-term solution to promote adaptive beliefs and motivation in the careers of student-athletes. However, practitioners should also consider ways to bolster the long-term sustainability of these effects.

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Declarations

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