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The Effects of REBT, and the Use of Credos, on Irrational Beliefs and Resilience Qualities in Athletes

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The use of rational emotive behavior therapy (REBT) in sport psychology has received little attention in research to date, but is steadily growing. Therefore, to further add to the building body of research, this study examines the efficacy of REBT (comprising five counseling sessions, and four homework assignments) in decreasing self-reported irrational beliefs, and increasing self-reported resilient qualities in five elite squash players from Malaysia. The study uses a single-case multiple-baseline across-participants design. Visual and graphical analyses revealed that REBT reduced self-reported irrational beliefs significantly in all athletes, and raised self-reported resilient qualities significantly in some athletes. Athlete's feedback, reflections on the usage of REBT, Athlete Rational Resilience Credos, and the practice of sport psychology across cultures are discussed, along with guidance for the future use of REBT in relevant settings.

Keywords: applied sport psychology, Asia, counseling intervention, single-case research, squash

Rational emotive behavior therapy (REBT) is a prominent form of cognitive-behavior therapy, which was developed in the 1950s by Dr Albert Ellis (Dryden & Branch, 2008). Ellis's interest in ancient philosophy led him to adopt Epictetus' maxim, that "men are not disturbed by things, but by their view of things" (Still & Dryden, 1999, p. 146), which fundamentally describes the underlying philosophy of REBT. REBT is distinguished from other therapies by suggesting that in response to adversity, dysfunctional emotions and maladaptive behaviors stem from irrational beliefs, while functional emotions and adaptive behaviors stem from rational beliefs (e.g., Ellis & Dryden, 1997).

In REBT there are four core irrational beliefs, one primary belief (demandingness) and three secondary beliefs (awfulizing, low frustration tolerance, and depreciation of self/life/others), which are derived from the primary belief. Irrational beliefs are rigid, extreme, and illogical, and are associated with a vast array of maladaptive emotions and behaviors (Dryden, 2009), which ultimately could hinder short and long-term athletic performance (Turner & Barker, 2014). For example,

an athlete with the irrational belief that "I really want to succeed and therefore I must, because failing would be totally awful" is likely to experience anxiety (Unhealthy Negative Emotion; Dryden, 2011), and display avoidance behavior. Rational beliefs also consist of one primary belief (preferences) and three secondary beliefs (anti-awfulizing, high frustration tolerance, and unconditional self/other/life-acceptance), which are derived from the primary belief. Rational beliefs are flexible, nonextreme, and logical, and are associated with a vast array of adaptive emotions and behaviors that could facilitate short and long-term athletic performance (see Szentagotai & Jones, 2010, for a review). For example, an athlete with the rational belief that "I want to succeed but that doesn't mean I have to, because failing is bad, but it's not totally awful," is likely to experience anxiety concern (healthy negative emotion; Dryden, 2011) and display approach behavior.

In essence, rational beliefs about adverse events (e.g., failure, poor treatment, rejection) trigger adaptive emotional and behavioral responses to adversity, and are considered to be "protective factors" (David, Freeman, & DiGiuseppe, 2010, p. 197), in stressful situations. These factors have been discussed in relation to resilience, which reflects the ability to react adaptively to adverse situations (Fletcher & Sarkar, 2013; Sarkar & Fletcher, 2014a; 2014b). Recent work in the field of REBT (Dryden, 2007; Neenan, 2009) and resilience in sport (Fletcher & Sarkar, 2012) intimates that there

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exists some symmetry between REBT and the concept of resilience that may help to better understand and develop resilience (Turner, 2016). The construct of resilience has been difficult to define (Fletcher & Sarkar, 2013; Neenan & Dryden, 2011), but definitions of psychological resilience are based around two concepts, the first of facing adversity, and the second of positive adaptation (for a full review, see Fletcher & Sarkar, 2013). Adapting to adversities has been repeatedly reported as a key component in the resilience literature (e.g., Galli & Gonzales, 2015; Gucciardi et al., 2011; Morgan et al., 2013, 2015; Sarkar & Fletcher, 2013, 2014a, 2014b), and some recent commentary has been made on the link between resilience and the REBT perspective (Dryden, 2007; Dryden, 2011; Neenan & Dryden, 2011; Roghanchi et al., 2013; Jarrett, 2013). From an REBT perspective “resilience comprises a set of flexible cognitive, behavioural and emotional responses to acute or chronic adversities that can be unusual or commonplace. These responses can be learned and are within the grasp of everyone. While many factors affect the development of resilience, the most important one is the belief that the person holds about the adversity. Therefore, belief is the heart of resilience.” (Dryden, 2011, p. 134).

Due to the central role of challenge appraisals and meta-cognitions in their grounded theory of resilience, Fletcher and Sarkar (2012) stated that “educational programs in challenge appraisal and meta-reflective strategies, such as evaluating personal assumptions, minimizing catastrophic thinking, challenging counterproductive beliefs, and cognitive restructuring, should form a central part of resilience training” (p. 676). Fletcher and Sarkar (2012) have described that Olympic champions perceived stressors as opportunities for growth, development, and mastery with regards to challenge appraisals. This is consistent with REBT, which teaches clients to believe, “I accept that bad things will happen, and that’s OK as this provides me with valuable opportunities to grow as an athlete and as a person” (Turner, 2016, p.9). Previous prescriptions for the enhancement of resilience in high performing athletes have been based on the work of Albert Ellis, which focus on assessing personal assumptions, disputing personal assumptions and thought processes, and de-catastrophizing potential scenarios (e.g., Schinke & Jerome 2002; Schinke, Peterson, & Couture, 2004). REBT promotes meta-cognition (Ruggiero, Ammendola, Caselli, & Sassarolli, 2014), which requires clients to think about thoughts and mental states as part of the ABCDE process. REBT is also a technique which minimizes catastrophic thinking, challenges counterproductive beliefs, helps to restructure cognitions, and increases the awareness of one’s own behaviors, thoughts and emotions. Thus, helping athletes to develop rational beliefs and instilling rational perspectives through REBT may be a valuable method for enhancing resilient qualities in individuals. .

The efficacy of programs which enhance resilient qualities within sport is still unknown, with the majority of programs being conducted within military settings

(e.g., Jarrett, 2008; Jarrett, 2013), educational domains (Galli & Gonzales, 2015), and workplace settings (Robertson et al., 2015). The present study applies one-to-one REBT with athletes, primarily to enhance self-reported resilient qualities by reducing irrational beliefs. To assess the effects of REBT on resilient qualities and irrational beliefs, a single-case design is adopted. A recent review of resilience research in sport (Galli & Gonzales, 2015) suggested that a mixed-method approach be used to obtain a more comprehensive view of sport resilience, and recommended that studies collect data over a time-series using multiple data collection time points. A single-case design that incorporates quantitative data collected over time, and qualitative social validation data can provide the necessary detail needed to more comprehensively assess training of resilient qualities, instead of focusing on performance data alone (e.g., Schinke & Jerome., 2002).

Some past research that has applied REBT with athletes has also used single-case designs (e.g., Cunningham & Turner, 2016; Turner & Barker, 2013). For example, Turner and Barker (2013) used a multiple-baseline across-participants design to examine the effects of REBT on irrational beliefs and cognitive anxiety with four youth cricketers. Data were collected over a 17-week period, revealing that irrational beliefs were reduced at the onset of the intervention in all athletes, while cognitive anxiety was reduced in three of the four cricketers. Despite notable examples (Bernard, 1985; Turner & Barker, 2013), the reported use of REBT with athletes in research and professional practice literature is scant (Turner, 2014), perhaps owing to the clinical connotations associated with REBT (Marlow, 2009).

The sparse research base reveals a need to investigate how REBT can be applied with varying athlete demographics, such as across cultures, across sports and with varying age groups. The majority of published applied sport psychology literature has originated from the West, particularly from America (Terry, 2011), and cultural issues related to applied sport psychology are recently gaining attention and further reporting is required (for unique online case-study accounts of sport psychology support in Asia, see Terry, Li-Wei, YoungHo, Morris, Hanrahan, 2014). Cultural considerations include practitioners being sensitive to sociocultural systems, religion, spirituality, and also language use (Sarkar, Hill & Parker, 2014; Hanrahan, 2011). Understanding the uniqueness of culture and taking cultural differences into account are considered as essential counseling competences (Weinberg & Williams, 2010), which stress the importance of cultural awareness. The current study was conducted by a British-born practitioner working in South East Asia, who is familiar with the local culture having traveled to the region before the study. Therefore, the current study adds to the growing body of cross-cultural applied sport psychology literature arising from Asia.

The application of REBT in sport has typically followed prominent guidelines from REBT literature (e.g., Ellis & Dryden, 1997), with sport-specific guidelines only recently emerging (Turner & Barker, 2014). The

application of REBT is driven by a structured therapeutic process that follows an ABCDE framework, where adversities (A) are explored, to which emotional and behavioral consequences (C) are then assessed with the aim of uncovering the irrational beliefs (B) which drive emotions and behavioral consequences at C. This process typically begins with rapport building and education with the athlete regarding the core structure and presumptions of REBT initially. Irrational beliefs are then disputed (D) and replaced with effective and new rational beliefs (E), which drive and promote functional emotions and adaptive behaviors. These rational beliefs are then disputed again through a recap to ensure that they are indeed rational, and the athlete is assisted in imbedding an overall rational philosophy to life.

To supplement and aid the imbedding and reinforcement of the ABCDE process, recent literature has encouraged the use of Athlete Rational Resilience Credos (ARRC) to complement REBT (Turner, 2016), which draws on the work of prominent REBT practitioners (e.g., Dryden, 2007). A Credo can be defined as “a set of beliefs, which expresses a particular opinion and influences the way you live” (Dryden, 2007, p. 219), and in REBT, credos typically reflect rational beliefs and desirable consequences (behaviors, emotions, and cognitions). A vast array of techniques can be used within REBT, many of which are currently under-researched. Therefore, this study examines the use of ARRCs to support an REBT intervention for the first time in literature.

In sum, recent literature calls for effective interventions that may help athletes develop resilience (e.g., Fletcher & Sarkar, 2012), and indicates that REBT might be a useful strategy for enhancing resilient qualities in athletes (e.g., Turner, 2016). In addition, both REBT and resilience literatures are growing in sport (Turner, 2016), but no study has yet examined whether REBT may enhance resilient qualities in athletes. Therefore, the primary purpose of this study is to examine the effects of REBT on the irrational beliefs and self-reported resilient qualities in Malaysian elite athletes using a single-case design. The use of REBT with South East Asian populations is also under-represented within current literature, as the majority of research is completed with Western samples, such as those in the United States of America or the United Kingdom (Dryden & Branch, 2008). In addition, this study applies ARRCs with athletes to support REBT, a thus far under-researched technique that has recently been recommended for use with athletes (Turner, 2016). Based on past research and commentary, it was hypothesized that REBT would decrease the irrational beliefs and increase self-reported resilient qualities in elite Malaysian athletes.

Contextual information

Currently, the majority of national elite athletes in Malaysia are based and accommodated in the Kompleks Sukan Negara (National Sports Complex, Bukit Jalil, Kuala

Lumpur) and receive full sport science support from the Institut Sukan Negara (ISN; National Sports Institute). Services available from ISN include support in strength and conditioning, nutrition, physiology, physiotherapy, biomechanics and sport psychology. The first and second authors are based in the United Kingdom and have previously undergone specific training in the practice of REBT. The first author provided sport psychology support within ISN as an intern, and completed the current study as part of the internship held at ISN.

Method

Participants

Participants were five (3 male and 2 female) elite squash athletes who were members of the national squad, aged between 18 and 26 ($M = 19.7$; $SD = 3.14$) with between 6 and 8 years of elite squash experience ($M = 6.83$; $SD = .99$). All athletes had experience of receiving at least some sport psychology support before the intervention, which typically consisted of the ‘canon’ of mental skills training (Andersen, 2009). Athletes were selected after a needs analysis, which involved a screening process where 28 athletes from various sports completed questionnaires indicating irrational performance beliefs and resilient qualities. Athletes with the lowest self-reported resilient qualities among the population were approached to take part in the intervention. Informed consent was also obtained, with ethical approval being granted from the university and ISN before any data collection.

Experimental Design

This study adopted a single-case, staggered multiple-baseline across-participants design (see Barker et al., 2011), where stable baseline data can be compared with data collected throughout the intervention period. Participants undergo varying durations of baseline, but receive the same intervention at different points in time. Specifically, the intervention commenced for Participant 1 in Week 3 after five baseline data points, for Participant 2 in Week 4 after seven baseline data points, for Participant 3 in Week 5 after nine baseline data points, for Participant 4 in Week 6 after 11 baseline data points and for Participant 5 in Week 7 after 13 baseline data points. This design allows changes in target variables over the series of time to be attributed to the intervention, rather than to extraneous factors (Kazdin, 1982). Internal validity is enhanced by replicating intervention effects across participants (Barker et al., 2013), and the Hawthorne effect is controlled for by illustrating that data changes in hypothesized directions only when the intervention is applied.

Measures

Irrational Beliefs. The irrational Performance Beliefs Inventory (iPBI; Turner et al., 2016) was used to assess

irrational beliefs in athletes. The questionnaire is designed for use in performance settings (e.g., sport and business) and consists of 28-items that measure four subscales; demandingness (7-items), low frustration tolerance (7-items), awfulizing (7-items), and depreciation (7-items). The iPBI also provides a composite score by averaging all subscale scores. Responses are made on a 5-point Likert-scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Example items are “I can’t stand not reaching my goals” (low frustration tolerance), “It is appalling if others do not give me chances” (awfulizing), and “I have to be respected by the members of my team” (demandingness). The iPBI has been shown to have good criterion, construct, and concurrent reliability (Cronbach’s $\alpha = .90$ to $.96$; Turner et al., 2016). Composite scores (Cronbach’s $\alpha = .87$) were used throughout the current study for brevity.

Resilient Qualities. A shortened 10-item version of the 25-item Connor-Davidson Resilience Scale (CD-RISC-10; Connor & Davidson, 2003) was used to assess resilient qualities in the athletes. The CD-RISC-10 was selected as it has shown to be suitable for measuring resilient qualities in athletes and is user-friendly (Gucciardi et al., 2011; Cronbach’s $\alpha = .83$). Responses are made on a 5-point Likert-scale ranging from 0 (*Not true at all*) to 4 (*True nearly all the time*). The CD-RISC-10 has also been deemed suitable to detect clinically important change in resilient qualities and has been recommended for use in interventions in a recent review of resilience scales (Windle et al., 2011). In the same review, it was reported that the CD-RISC-10 scored highly for internal consistency (Cronbach’s α range between 0.70 and 0.95 in previous studies) and construct validity (at least 75% of results in accordance with hypotheses). Total scores were used in the screening process for the CD-RISC-10 in the current study (Cronbach’s $\alpha = .87$). Example items from the CD-RISC-10 are “I am able to adapt when changes occur,” “Under pressure, I stay focussed and think clearly,” and “Having to cope with stress can make me stronger.”

Social Validation. For studies adopting a single-case research design, it is recommended that social validation is undertaken at the end of procedures to supplement statistical data (Page & Thelwell, 2013). Statistics do not fully detail the efficacy of interventions, and therefore social validation reveals rich data about socially important outcomes or goals of an intervention, and the intervention procedures carried out (Page & Thelwell, 2013; Kazdin, 1982). Social validation should focus on three key elements, a) the social significance of the goals of the intervention b) the appropriateness of procedures placed, and c) participant satisfaction with the results of the intervention (Wolf, 1978; Kazdin, 1982; Page & Thelwell, 2013). The present study used one-to-one semi-structured interviews to capture detailed feedback about the intervention procedures (Page & Thelwell, 2013), and in addition, participant ratings were also provided

for the intervention as a whole (between 0 and 10). Example questions were “what are your judgements on the goals of the intervention?,” “What are your thoughts on the sessions and their structure?,” and “What was your favourite part of the programme (intervention)?” In an effort to avoid bias, the practitioner conducted only one out of five interviews, with the other four interviews being carried out by a psychologist based in ISN. By not having the practitioner conduct all the interviews, bias was reduced as much as possible, as having the practitioner conduct all social validation interviews may have affected the responses that participants gave, and could have unintentionally produced demand characteristics. In brief, it was believed participants may be more honest if talking to a third party. Interview transcripts were created and triangulation procedures were carried out to ensure consistency in the transcripts and themes, which were deducted from following guidelines of thematic analysis (Braun & Clarke, 2006) between the interviewer and the author on the transcripts. A deductive approach was chosen as opposed to an inductive approach, due to the specificity of research questions presented. Transcripts were read and reread, so that familiarity with the transcripts was achieved, after which coding and theme development were directed by the existing concepts and ideas around rationality and resilient qualities.

Procedures

To ensure that an intervention to enhance resilient qualities was appropriate for the athletes, a screening process took place inside ISN. Twenty-eight elite athletes (11 females and 17 males from wushu, squash, and athletics) completed the iPBI (Turner et al., 2016) and CD-RISC-10 (Connor & Davidson, 2003) in May 2015. Of the athletes screened, five were selected for the intervention because they reported the lowest scores in resilient qualities across the sample. Participants scored 17, 15, 18, 15 and 16 respectively out of a maximum of 40. The mean average score for the CD-RISC-10 among the population at screening was 25.79, and the highest score was 36.

The athletes selected to take part in the REBT intervention completed the iPBI and CD-RISC 10 twice weekly, normally on a Monday and Thursday with reminders being sent via text message along with social desirability instructions. All data collection points were adhered to, and there were no missing data points. Importantly, mental skills training with the team sport psychologist was suspended during the intervention so as not to conflict with the current study. Participants completed weekly measures through baseline, intervention, and postintervention periods. A social validation interview was then conducted, followed by an additional 4-week follow-up data point. In all, Participant 1 provided data over 14 weeks, Participant 2 provided data over 15 weeks, Participant 3 provided data over 16 weeks, Participant 4 provided data over 17 weeks, and Participant 5 provided data over 18 weeks.

Intervention

Following prescriptions for using REBT in sport, five one-to-one REBT sessions lasting an hour each and four homework assignments were set which were all aligned the ABCDE process (see Turner & Barker, 2014). Homework assignments were cognitive and behavioral in nature, and were set as they are vital to the REBT therapeutic process (Ellis & Dryden, 1997; Dryden & Branch, 2008). There was one session per week, and the third session integrated the ARRC into the intervention. The ARRC shows a clear target to aim for, as it illustrates resilient qualities that can inspire or motivate athletes to work toward, and to adopt a rational life-philosophy. The ARRC was broken down into short sections, which then athletes were asked to read, after which discussion around the credo took place. Athletes were encouraged to highlight specific sentences of interest, which were discussed to ascertain their salience to the athlete. The ARRC was inspected in this way to discuss any ambiguity or misunderstanding before the athlete began to adopt the credo as part of their daily routines by reading and rereading passages. Athletes were then tasked with rewriting the ARRC in their own words, thus forming their own personal credo. To further encourage intellectual understanding of the credo, athletes were set a cognitive assignment to write a full credo using their own words as homework, which was to be prepared in time for the next session. In addition, athletes were set behavioral assignments and were encouraged to use the credo (or specific parts of the credo) in real-life situations such as in training, matches, or situations outside of their sport.

The fourth session consisted of a review of the previous three sessions and in particular the usage of the ARRC. Athletes were aided in identifying which parts of the credo could be used in specific situations, such as failure, losses, and setbacks. Athletes were encouraged to use smaller passages of the credo as self-talk which served as behavioral homework assignments. In addition, a cognitive assignment was in which athletes could add or remove content in the credo, so that it could be refined to meet their needs. In the fifth session, a review was conducted of all previous sessions. The athletes were provided with hypothetical situations for which they applied REBT to ensure that they were able to use REBT independently. The session ended when the practitioner was satisfied with the athlete's ability to apply REBT effectively, by successfully talking themselves and the practitioner through the ABCDE process. Athletes reflected on training, competitions, and personal matters, and were given time to take themselves through the ABCDE process alone.

Treatment of raw data

Data were first visually inspected to determine whether REBT caused a change in irrational beliefs and resilient qualities over a time-series, with visual analysis being a useful indicator to determine large and small effects

(Nourbaksh & Ottenbacher, 1994; Ottenbacher, 1986). Visual inspection of irrational beliefs (Figure 1) and resilient qualities (Figure 2) took place for each participant, and descriptive statistics were also considered (Table 1). Hrycaiko and Martin (1996) have suggested that if a meaningful change has occurred following an intervention it can be seen graphically based on a) the number of over-lapping data points between the phases of preintervention and postintervention phases, b) the immediacy of effects following the intervention, and c) the size of effects following the interventions. For each participant, the means, standard deviations, percentage changes in means and effect sizes (Cohen's *d*) were calculated for preintervention and postintervention phases for irrational beliefs and resilient qualities (see Table 1).

Graphical Analysis

To further determine intervention effects, graphical analysis was performed to aid visual analysis (Nourbaksh & Ottenbacher, 1994; Ottenbacher, 1986). Both parametric and nonparametric statistical methods can be used to compare baseline to intervention phase data, however there is no standard method for analyzing single-subjects data (Barker et al., 2011). An assumption of using traditional parametric tests (such as ANOVA and *t* tests) is that data sets are independent of each other, but when adjacent data points are correlated over time this is known as serial dependency and this assumption is violated (Barker et al., 2011; Ottenbacher, 1986). A preliminary autocorrelation analysis was conducted on all dependent variables for each phase (except for Participant 1's data points where phases were analyzed together due to too few data points, see Ottenbacher, 1986) as shown (Table 1). All data sets revealed significant autocorrelation coefficients with the exception of Participant 2's depreciation scores, and Participant 3 & 4's scores for resilient qualities. When a significant level of autocorrelation is present in the data, transformational procedures can be applied to reduce serial dependency to nonsignificant levels at which traditional tests (ANOVA and *t* test) can be applied, however, "any data transformation will invariably modify the nature of a data series and result in a loss of some information which may be of value to therapist or client" (Ottenbacher, 1986: p. 178). Therefore, transformation did not take place.

The split-middle technique (Kazdin, 1982; White, 1974) is a method of quantitatively analyzing data (Ottenbacher, 1986), and takes into account most kinds of serial dependency involved in autocorrelation (Ottenbacher, 1986). A celeration line is produced which is then hypothetically extended into the intervention phase (for guidelines see White, 1974). If the intervention had no effect, then data points in the intervention phase would still be split through the middle of the celeration line. If this isn't the case, a basis for statistical testing using binomial tests is presented (Ottenbacher, 1986) in which binomial tests determine the statistical significance of such intervention effects (Barker et al., 2011). When

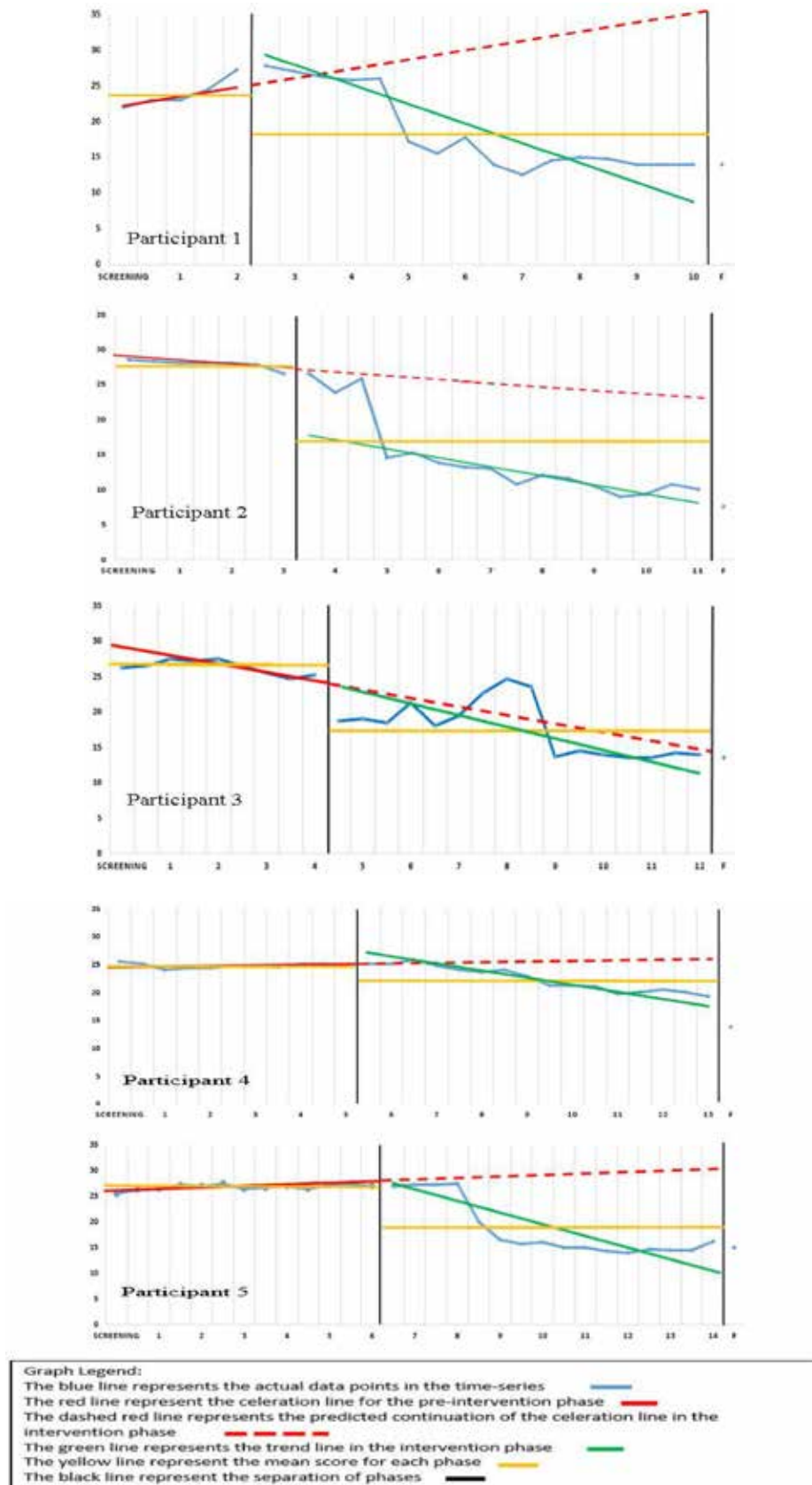


Figure 1 — Graphed data for composite irrational beliefs across all phases for all participants.

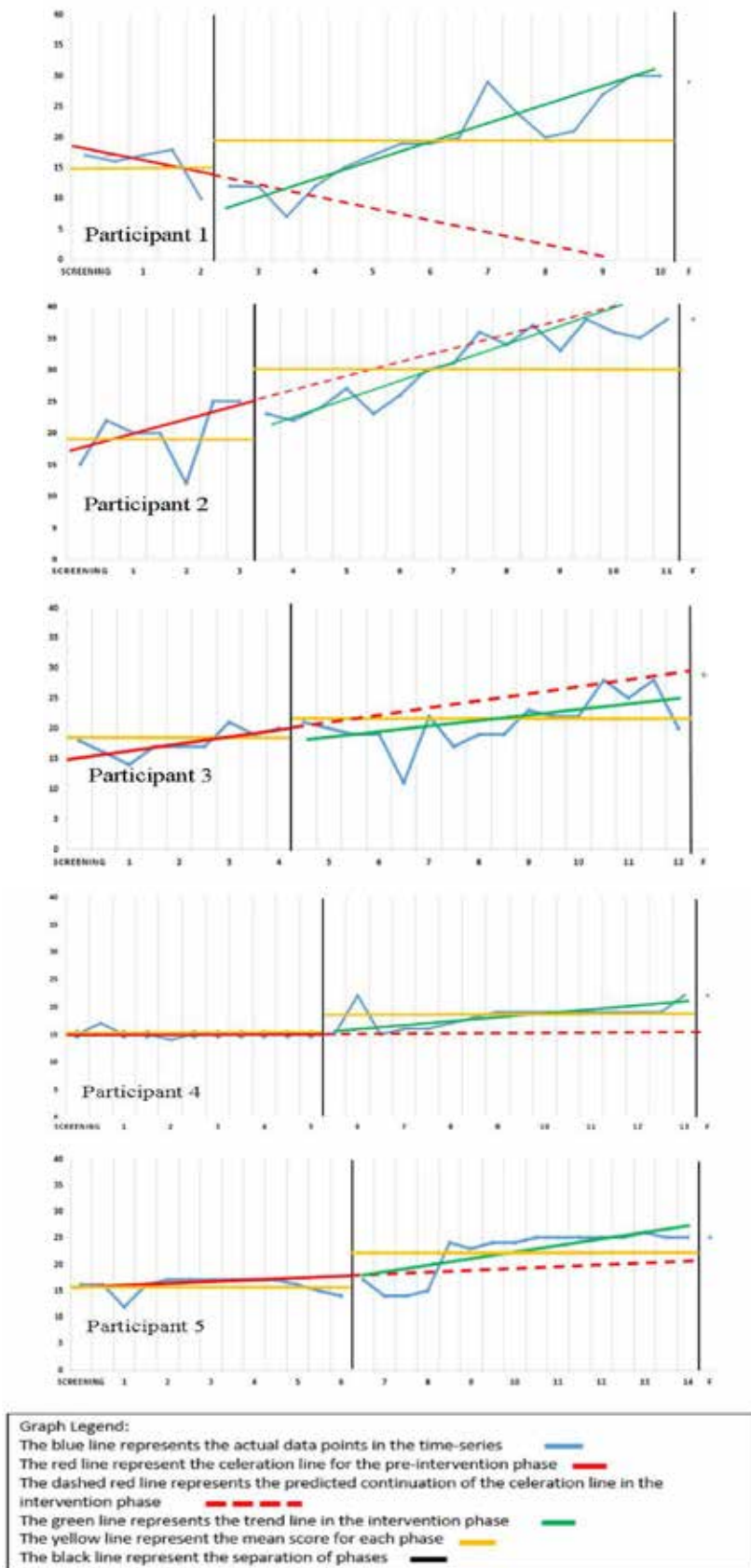


Figure 2 — Graphed data for resilient qualities across all phases for all participants.

Table 1 Pre- and Post-Intervention Mean \pm SD for Irrational Beliefs and Resilience Variables

	Demands		LFT		Awfulizing		Depreciation		Composite		Resilience	
	Pre-	Post-	Pre-	Post-	Pre-	Post-	Pre-	Post-	Pre-	Post-	Pre-	Post-
Participant 1	25.40 \pm 1.34	19.81 \pm 6.45	26.8 \pm 2.17	19.5 \pm 6.66	23.4 \pm 3.58	18.13 \pm 6.45	20.2 \pm 2.28	16.56 \pm 4.41	23.95 \pm 2.05	18.5 \pm 5.76	15.6 \pm 3.21	19.63 \pm 7.03
Participant 2	27.14 \pm .90	14.19 \pm 5.63	28.57 \pm 2.37	14.5 \pm 6.36	28.14 \pm 1.77	14.5 \pm 6.41	27.57 \pm 1.62	14.19 \pm 5.30	27.86 \pm .64	14.34 \pm 5.76	19.86 \pm 4.88	30.81 \pm 5.84
Participant 3	27.11 \pm 1.36	18.38 \pm 4.35	26.67 \pm 1.00	20.69 \pm 4.11	26.67 \pm 1.94	17.63 \pm 4.43	24.89 \pm 2.42	14.81 \pm 3.89	26.33 \pm 1.00	17.72 \pm 3.90	17.67 \pm 2.12	20.94 \pm 4.12
Participant 4	24.82 \pm 0.75	23.44 \pm 2.28	27.45 \pm .69	23.81 \pm 3.08	22.45 \pm .69	21.44 \pm 1.31	24.09 \pm 1.04	20.75 \pm 2.84	24.70 \pm .43	22.36 \pm 2.21	15.09 \pm .70	18.31 \pm 2.09
Participant 5	26.54 \pm .52	18.25 \pm 5.37	27.85 \pm .55	20.19 \pm 5.46	27.69 \pm .63	17.94 \pm 6.10	25.15 \pm 1.34	17.50 \pm 5.34	26.81 \pm .56	18.47 \pm 5.42	15.92 \pm 1.50	22.25 \pm 4.42

using this approach, changes in trend are analyzed (slope direction and acceleration/deceleration of the slopes), along with levels of the trend. For brevity, changes in trend slopes (Table 2) for the dependent variables, coupled with binomial tests, were selected to determine statistical significance on changes in resilient qualities and composite irrational beliefs.

Results

Irrational Beliefs and Resilient Qualities

Participant 1. Participant 1 had five overlapping data points between phases for composite irrational beliefs (Figure 1) and 6 overlapping data points between phases for resilient qualities (Figure 2). For changes between preintervention to postintervention phases in composite irrational beliefs, participant 1 showed a 22% decrease (large effect size with $d = 1.20$) in demandingness a 27.24% decrease (large effect size with $d = 1.47$) in low frustration tolerance, a 22.52% decrease (large effect size with $d = 1.01$) in awfulizing, an 18.02% decrease (large effect size with $d = 1.04$) in depreciation, and a 22.76% decrease (large effect size with $d = 1.26$) in composite scores. For changes in resilient qualities between preintervention to postintervention phases, participant 1 showed an increase of 25.83% (medium effect size with $d = .73$). Changes in composite irrational beliefs occurred immediately after the onset of the intervention but scores for resilient qualities began to increase only after the second session. Binomial tests demonstrated a significant decrease in irrational beliefs between phases ($p < .001$) and a significant increase in scores for resilient qualities between phases ($p < .04$). To conclude, descriptive statistics and visual analysis show that across phases, a reduction in irrational beliefs and an increase in resilient qualities occurred for Participant 1, and statistical analysis supports this inference. The follow-up data indicates that both irrational beliefs and resilient qualities remained stable when compared with the last data point of the postintervention phase.

Participant 2. Participant 2 had two overlapping data points for composite irrational beliefs between phases (Figure 1) and four overlapping data points between

phases for resilient qualities (Figure 2). For changes between preintervention and intervention phases in irrational beliefs, participant 2 showed a 47.71% decrease (large effect size with $d = 3.21$) in demandingness, a 49.25% decrease (large effect size with $d = 2.93$) in low frustration tolerance, a 48.47% decrease (large effect size with $d = 2.90$) in awfulizing, a 48.53% decrease (large effect size with $d = 3.41$) in depreciation, and a 48.52% decrease (large effect size with $d = 2.90$) in composite scores. For changes in resilient qualities between preintervention and postintervention phases, Participant 2 showed a 55.14% increase (large effect size with $d = 2.03$). Changes in composite irrational beliefs occurred immediately after the onset of the intervention with a decrease in scores, and scores for resilient qualities also followed with an initial dip, but began to increase after the first session. Binomial tests also demonstrated a significant decrease in composite irrational beliefs between phases ($p < .001$) and a nonsignificant increase in resilient qualities, although a steeper slope of acceleration was found in the trend line for postintervention scores for resilient qualities (Table 2). To conclude, descriptive statistics and visual analysis show that across phases a reduction in irrational beliefs and an increase in resilient qualities occurred for Participant 2. Statistical analysis suggests the reduction in irrational beliefs is significant however the increase in resilient qualities is nonsignificant. The follow up data points showed a further decrease in irrational beliefs when compared with the last data point of the postintervention phase, and resilient quality levels remained stable when compared with the last data point of the postintervention phase.

Participant 3. Participant 3 had three overlapping data points for composite irrational beliefs between phases (Figure 1) and 8 overlapping data points between phases for resilient qualities (Figure 2). It is noteworthy that participant 3's overlapping points for composite irrational beliefs occurred between the third and fourth session, which is unique in the current study as this is toward the end of the REBT intervention itself. For changes between preintervention and postintervention phases in irrational beliefs, participant 3 showed a 32.2% decrease (large effect size with $d = 2.71$) in demandingness, a 22.42% decrease (large effect size with $d = 2.00$) in low frustration

Table 2 Direction of Slope and Calculation of Slope Change for All Measures Taken

	Composite (COMP) Slopes		Change in Slope (COMP)	Resilience (RES) Slopes		Change in Slope (RES)
	Pre-	Post-		Pre-	Post-	
Participant 1	×1.11	÷1.61	1.78	÷1.23	×2.43	×2.99
Participant 2	÷1.05	÷1.40	÷1.33	×1.44	×1.49	×1.03
Participant 3	÷1.17	÷1.42	÷1.21	×1.18	×1.12	×0.95
Participant 4	×1.01	÷1.16	÷1.17	1.00	×1.16	×1.16
Participant 5	×1.06	÷1.36	÷1.44	×1.10	×1.29	×1.17

tolerance, a 33.90% decrease (large effect size with $d = 2.64$) in awfulizing, a 40.50% decrease (large effect size with $d = 3.11$) in depreciation and a 32.70% decrease (large effect size with $d = 3.02$) in composite scores. For changes in resilient qualities between preintervention and postintervention phases, participant 3 showed an 18.51% increase (large effect size with $d = 1.00$). Changes in composite irrational beliefs were immediate with a decrease in scores from the onset of the intervention, and scores for resilient qualities followed with an initial decrease, until after the second session when they began to increase over time. Binomial tests showed that a significant decrease in composite irrational beliefs occurred between phases ($p < .002$). To conclude, descriptive statistics and visual analysis show that across phases a decrease in irrational beliefs and that an increase in resilient qualities occurred for Participant 3. Statistical analysis suggests the reduction in irrational beliefs is significant however the increase in resilient qualities is nonsignificant. The follow up data points showed that irrational beliefs remained stable, and that resilient qualities increased with an upwards spike when compared with the last data point in the postintervention phase.

Participant 4. Participant 4 had five overlapping data points between phases for composite irrational beliefs (Figure 1) and 5 overlapping data points for resilient qualities (Figure 2). For changes between preintervention and postintervention phases in irrational beliefs, participant 4 showed a 5.56% decrease (medium effect size with $d = .81$) in demandingness, a 13.26% decrease (large effect size with $d = 1.63$) in low frustration tolerance, a 4.5% decrease (large effect size with $d = .96$) in awfulizing, a 13.86% decrease (large effect size with $d = 1.56$) in depreciation, and a 9.47% decrease (large effect size with $d = 1.47$) in composite scores. For changes in resilient qualities between preintervention and postintervention phases, participant 4 showed an increase of 21.34% (large effect size with $d = 2.07$). Changes in composite irrational beliefs occurred after the second session where they began to decrease, with scores for resilient qualities increasing immediately from the onset of the intervention. Binomial tests also demonstrated that a significant decrease in irrational beliefs occurred between phases ($p < .01$) and that a significant increase in scores for resilient qualities occurred between phases ($p < .002$). To conclude, descriptive statistics and visual analysis show that across phases a reduction in irrational beliefs and an increase in resilient qualities occurred for participant 4, and statistical analysis supports this inference. The follow up data points showed that irrational beliefs decreased and that resilient qualities remained stable when compared with the last data points in the postintervention phases respectively.

Participant 5. Participant 5 had four overlapping data points between phases for irrational beliefs (Figure 1) and 5 overlapping data points between phases for resilient qualities (Figure 2). For changes between preintervention and postintervention phases in irrational beliefs,

Participant 5 showed a 31.24% decrease (large effect size with $d = 2.17$) in demandingness, a 27.5% decrease (large effect size with $d = 1.97$) in low frustration tolerance, a 35.21% decrease (large effect size with $d = 2.25$) in awfulizing, a 30.41% decrease (large effect size with $d = 1.97$) in depreciation, and a 31.11% decrease (large effect size with $d = 2.16$) in composite scores. For changes in resilient qualities from preintervention to postintervention phases, Participant 5 showed an increase of 39.76% (large effect size with $d = 1.92$). Changes in irrational beliefs occurred after the second session, and scores for resilient qualities dipped but then increased until the third session at which point levels of resilient qualities leveled off. Binomial tests showed that a significant decrease occurred in irrational beliefs between phases ($p < .001$) and a significant increase occurred in scores for resilient qualities between phases ($p < .04$). To conclude, descriptive statistics and visual analysis show that across phases a reduction in irrational beliefs and an increase in resilient qualities occurred for Participant 5, and statistical analysis supports this inference. The follow up data points showed that both irrational beliefs and resilient qualities remained stable when compared with the last data point of the postintervention phase.

Social Validation Data

Qualitative data were thematically analyzed following relevant guidelines (Braune & Clarke, 2006). Five themes were collated from the social validation interview transcripts and are presented below with examples included.

The first theme identified was “enhanced well-being and emotional control,” and this theme was consistent across all five participants in that well-being and emotional control was enhanced directly as a result of the REBT intervention. Participant 1 reflected on a recent adversity, “when I incurred my injury, I don’t feel so down...I feel more happy (happier)...there’s no worries.” Participant 2 claimed he learnt “how to control my emotions,” and explained that he could now control his emotions often in general. Participant 4 cited that their favorite part of the intervention was the “little I” exercise (for self-acceptance) in which she also added that “(REBT) helped me understand myself more...like the root of my problems...or how I feel about my problems, because sometimes we don’t know why we feel that way...now like, I learnt to feel better about myself.”

For the second theme of “ability in handling adversities effectively,” all participants believed that they were able to handle adversities more effectively as a direct result of the REBT intervention. Participant 1 showed an adaptive response to a recent adversity in that he now “works harder in training,” with Participant 3 showing a similar response in that he was “just trying to get back to where I was before...(the intervention has helped me to) handle the losses better...yeh, it gets me back to training quicker so I don’t waste too much time...(which helps my performance) especially if I’m playing back-to-back tournaments...I don’t waste time to recover”

and that he also “bounces back faster (than before).” In addition, Participant 3 added, “I think its er...I always wanted to change the situation, like...now it’s fix the C (consequences) before the A (adversity)...Yeh I think I have experienced so many of those kinda situations and now the way I handle the C is different,” which shows he has adopted a new strategy to take on adversities in a manner which is consistent with REBT theory. Participant 5 reported a decrease in “negativity” and an increase in “positivity” when faced with adversities related to sporting performances and in general life.

For the third theme of “changing to rationality/flexibility and the benefits,” all participants strongly confirmed that they held more rational and flexible beliefs after the REBT intervention. Participant 2 presented an interesting case, where he explained that his father is “very flexible, even though he has been hurt or whatever, he’s still flexible enough to talk to me...and I think of that, and then I will do it the same way...being flexible enough to handle it,” and his father as a role model of rationality, whom he aspires to be like. Participant 5 commented “It (REBT) kinda made me more flexible, instead of rigid...I think it helped me a lot...before I was quite rigid but like...I am more flexible now.”

For the fourth theme of “feedback on credos and their usage,” the responses were highly mixed. Participant 1’s favorite part of the whole intervention was creating the credo, but suggested the traditional form of REBT had helped him more than the credo, however he still had faith in the effectiveness of the credo by saying “if I read it everyday then it will help me...if you’re faced with adversity, (and) if you often read that credo, you won’t feel so bad. You will feel better.” Favorable comments were given about credo usage from Participant 2, such as “when I’m having a little stress or some anger...or some emotions I will read it...I mean if someone is saying things which hurt me, I will think of what I wrote, because I wrote that my dad used to come home late...even though he sometimes got hurt or what(ever), he’s still flexible enough to talk to me.” It must also be mentioned that although credo usage was deemed effective, Participant 2 felt that using the credo was not necessary to instil flexibility, and that REBT was impactful without using or creating a credo. Participant 3, 4 and 5 had not created a credo and provided comments that the ARRC was confusing, lengthy, difficult to recall, and not necessary. Participant 4 suggested that the ARRC could have been presented in a bullet point format for ease of learning.

For the fifth theme of “feedback on intervention and procedures,” all participants felt that REBT was unique, interesting, and helpful. An extract from Participant 4 being “the sessions were pretty good...it’s like an extra class...it’s pretty interesting cos it’s something new for me...I know this programme is new (to ISN) ... I learnt some stuff which has never occurred to me before.” Participants enjoyed the sessions, however Participant 3 felt that two sessions would have been enough instead of five sessions, and Participant 5 said the opposite in that she wished to have more than five sessions. Mixed responses

were given with regards to completing questionnaires twice a week. Participant 1 and Participant 3 suggested they already knew “how” to answer before completing the questionnaires. In other words, Participants 1 and 3 may have responded to the questionnaire items in a way that demonstrated what they would like to think, rather than what they actually thought at the time. In REBT, intellectual insight occurs when a client is able to appreciate that their irrational beliefs are unhelpful, and therefore start to endorse rational beliefs at a surface level. However, intellectual insight is an important stage of REBT and is a platform for significant later change (Dryden, 2009). They also described completing the same questionnaires twice a week as “annoying.” Participant 4 and 5 both appreciated completing the same questionnaires twice a week as it reminded them of their sessions, and kept them self-aware, and mindful of what they were learning.

Respectively, participants gave the intervention procedures a rating of 8, 8, 7, 7 and 7 out of 10. Participant 3 said he would have rated “8 or 9” had he taken more of an active role in completing homework which would have led to him gaining more from the intervention.

Discussion

This study is the first to examine the effects of REBT on irrational beliefs and resilient qualities in athletes. Although literature suggests a link between rational beliefs and resilience (e.g., Neenan & Dryden, 2011; Fletcher & Sarkar, 2012), the current study is the first to rigorously study the enhancement of resilient qualities through an REBT intervention. Furthermore, the current study is the first in the literature to use the ARRC as part of the REBT process. The ARRC has been advocated for use with athletes to enhance resilience (Turner, 2016), but the current study is the first to examine its usage empirically and obtain feedback on the implementation of credos as part of the ABCDE process. It was hypothesized that REBT would reduce irrational beliefs and increase self-reported resilient qualities of elite Malaysian athletes.

Data analyses support the hypothesis that REBT would decrease irrational beliefs. Visual analysis displays that all participants experienced a substantial reduction in irrational beliefs when REBT was introduced. This finding supports past research that has applied REBT in a similar one-to-one approach with athletes (e.g., Turner & Barker, 2013). Statistical analysis also showed a significant reduction in irrational beliefs for all participants, and the shift to flexible beliefs was apparent in the social validation data. The two athletes that demonstrated the largest reductions irrational beliefs (participants 1 and 2) had the first and third largest changes in slope for irrational beliefs, and were the only athletes to complete all homework assignments, and had fully created and reviewed their own credos thoroughly (see supplementary material for an example).

Data analyses also support the second hypothesis that REBT would increase self-reported resilient qualities.

This is the first study to report increases in resilient qualities using REBT, and the findings of the current study supports the notion that REBT could be an effective intervention for promoting resilience and enhancing resilient qualities, as suggested in past commentary and literature (e.g., Neenan & Dryden, 2011; Turner, 2016). Visual analyses indicate that all participants demonstrated an increase in resilient qualities, however graphical and statistical analyses show that only three of the five athletes (Participants 1, 4 and 5) incurred substantial and significant increases in resilient qualities when REBT was introduced. Participants 3 and 4 showed smaller increases in resilient qualities that were not statistically significant. In addition, the current study uses celeration lines as part of the data analyses, which is a rarely used method in sport and exercise psychology research. Celeration lines are useful for displaying clear trends and directions of data, and thus upon visual inspection of graphical data, these lines can help a reader see the changes in the body of data across phases, and the changes in slopes and their angles (Barker et al., 2011).

For Participant 1 and 2, a lesser amount than the recommended eight baseline points were used, and this may impact accurate inspections of graphical data (Ottenbacher, 1986). Participant 2 also displayed high variability in baseline data with two consecutive data points for self-reported resilient qualities having a gap of 13 in the scores, which is extremely large considering the CD-RISC-10 has a maximum score of 40. Variability of this magnitude may have impacted on the calculation and creation of the celeration line, and therefore, the binomial tests. Therefore, Participant 2's graphical data should be treated with caution.

Social validation data revealed perceived changes in behaviors, coping strategies, and general outlook for participants. The thematic analysis of semistructured interviews was advantageous, and the data obtained showed that REBT was a worthwhile, interesting, and useful intervention for the athletes. ARRCs, homework tasks, and questionnaires received mixed feedback. However, the delivery and structure of the one-to-one REBT sessions were well received. Interestingly, completing measures twice a week may have served as a reminder that reinforced REBT concepts, and could have encouraged some reductions in irrational beliefs, as illustrated by Participant 4 and 5. On an important note Participant 1 and 3 may have responded to the questionnaires with intellectual insight, rather than belief change. Although intellectual insight is an important stage of REBT researchers should bear this in mind when utilizing REBT in applied interventions, and seek ways to establish if clients are simply reporting their intellectual insights, or actually reporting significant changes in rationality.

The finding that self-reported resilient qualities increased following the REBT intervention can be explained in several ways. REBT aims to reduce irrational beliefs and promote rational beliefs, with belief considered by some to be "the heart of resilience" (Dryden, 2011, p.134). Therefore, swapping irrational beliefs for

rational beliefs could facilitate an increase in perceived resilience and resilient qualities. For example, increased high frustration tolerance (rational), reflected by a belief that "I can tolerate this situation, I have handled worse things before, and it will be worth it if I do tolerate it," intimates an adaptive response to adversity. Rational antiawfulizing beliefs that recognize adversity as "bad" but not "awful" are likely to help athletes respond to adversity with health emotions that trigger constructive behaviors. More fundamentally, the central theory of REBT is that emotions and behaviors are driven by beliefs rather than events, and this can instill a greater sense of control in athletes, which has been linked to resilience in past literature (e.g., Sarkar & Fletcher, 2014; Turner & Barker, 2013). Indeed, self-talk is the key to cognitive control (Zinsser et al., 2010), and therefore, if a person can a) be entirely self-aware of their cognitions, b) recognize their own psychological dysfunction, c) use rational statements to dispute such thoughts, and d) repeat such statements regularly through self-talk, they would stand a greater chance at remaining rational and therefore more likely to present resilient responses in the face of adversity. Further studies could investigate how specific irrational and rational beliefs relate to resilient qualities in individuals, and could attempt to investigate how certain beliefs are able to drive resilient responses.

There are some study limitations present, that if addressed would strengthen the findings. First, sport psychology literature lacks a gold-standard sport-specific measure of resilient qualities. Although the CD-RISC-10 has been used in sport settings (Gucciardi et al., 2011; Gonzales et al., 2016), a sport-specific measure of resilient qualities would be advantageous, as psychometrics should consider situational factors in the measurement of constructs (Sarkar & Fletcher, 2013; Ziegler & Horstmann, 2015). The CD-RISC-10 demonstrates limited evidence for the selection and inclusion of some of the items (stemming from its original version, the CD-RISC-25), and also contains a "considerable conceptual overlap with coping" (Gonzalez et al., 2016, p. 38). Therefore, the CD-RISC-10 cannot be fully relied upon as a premium measure of resilience, but can be seen as a convenient measure of resilient qualities in athletes at the individual level only (Gonzales et al., 2016). Recent literature has expressed the need for a sport-specific resilience measure which considers the three pivotal components of adversity, positive adaptation, and protective factors, all of which complete an accurate representation of resilience in sport (Sarkar & Fletcher, 2013). However, a measure encompassing these three pivotal components which is specific to sport and performance is yet to arise, and is urgently required for practitioners and researchers to use in their work. Researchers are encouraged to produce a gold-standard measure of resilience (Windle et al., 2011), and to make such a measure available to researchers.

Second, only one follow-up measure was taken due to time constraints outside of the authors' control. Although the follow-up time point does provide a marker for longer-term change, it does not allow for further visual

analyses using single-case methods. Future research should assess long-term changes by collecting several follow-up measures (at least 8 per phase; Ottenbacher, 1986), as this will help to understand the lasting impacts of interventions and will help practitioners to enhance the effectiveness of their work. Thirdly, although REBT addresses several elements of developing resilience, a clear emphasis is made that REBT would be useful to serve as a central component in more comprehensive resilience training programs, which could also focus on environmental factors and social support (Fletcher & Sarkar, 2012). This would increase the likelihood of intervention effectiveness by covering all aspects and components of resilience.

Despite the limitations, the current study was able to engage an elite sample of athletes, used complex and robust single-case methods, employed a needs analysis (which is typical of applied practice; Marlow, 2009), includes quantitative and qualitative data to examine intervention effects, and is a first-step to satisfy calls for research to investigate resilience / resilient qualities building programs in sport (Galli & Gonzales, 2015). In addition, this study includes data on the perceptions of REBT from the participating athletes. The data revealed that the intervention procedures were generally well accepted, which was reflected in the high ratings given by the participants ($M = 7.4$, $Range = 7-8$, out of 10) for the program. However, participants felt that there were too many data collection points. In single-case research (which typically uses repeated data collection methods), there is always a danger that participants can become overburdened with questionnaires. Future research should explore similar research designs that do not rely on self-report measures to assess intervention effects, such as observation data or video analysis.

A notable strength of the current study is the Malaysian sample that received the intervention. The majority of research applying REBT with athletes recruits from the U.K. or the U.S. (Turner, 2014), with some notable exceptions of a male Olympic medal winning table-tennis player from Hong Kong (Si & Lee, 2008), Japanese female high-school soft-ball players and professional Australian footballers (Bernard, 1985). It is imperative to consider cultural variances when applying REBT techniques such as empirical, logical and pragmatic questioning which form the disputation (D) phase of the ABCDE process (Turner & Barker, 2013). The way in which a practitioner achieves this should account for cultural variations. For example, practitioners should be sensitive when producing arguments in the disputation phase, and ensure that their levels of directness are appropriate when communicating. When practicing sport psychology across cultures, it is also important to recognize that subtle and large differences in attitudes or opinions can exist between the practitioner and the client, due to fundamental cultural differences. Practitioners should be mindful that to successfully apply sport psychology across different cultural environments, immersion into the said culture should take place (Hanrahan, 2011).

What is striking, based on this study and extant findings, is the applicability and transferability of REBT across cultures. Future research should specifically investigate the application of REBT across many cultures to try to understand where the practice and interpretation of REBT may be adjusted to suit particular audiences (see Sarkar, Hill & Parker, 2014). In particular, a comparison between using REBT with Malaysian elite athletes and surrounding nations within South-East Asia would add greatly to the literature.

Another important purpose of the current study was to critically reflect on the application of ARRCs (Turner, 2016) for the first time in research literature. ARRCs require a deep understanding of REBT to aid the full interpretation of the rational beliefs presented. In this study, some athletes felt discouraged reading the text all at once. Thus, specific sections of the ARRC were presented separately and inspected, rehearsed, then used in specific situations. What is particularly pertinent to the present sample is that the ARRC contains a very high level of English. This may be problematic because for many of the athletes, English was their third tongue behind languages such as Malay, Mandarin, and Cantonese. The first author expended a significant amount of time explaining several words within the ARRC to athletes and this maybe a reason why the credo received equivocal feedback from athletes. Therefore, practitioners who wish to use ARRCs to aid the REBT process could firstly consult relevant texts (e.g., Turner, 2016; Dryden, 2011; Dryden, 2007), produce their own example credos, and present these to clients and athletes at a level more easily comprehended. Practitioners should be aware of their clients' learning styles and bear in mind that credos should not be used with every client, however they can be used as a useful tool to help instil rationality.

In conclusion, the aim of the current study was to examine the efficacy of REBT with athletes in reducing irrational beliefs and increasing self-reported resilient qualities, and to examine the use of ARRCs for the first time. This study provides further evidence that REBT successfully reduces irrational beliefs, and indicates that REBT can increase resilient qualities in athletes. In addition, the ARRC shows promise to supplement REBT work with athletes. The usage of REBT in sport still remains under-researched, and thus there is a continued need for applied practitioners and researchers to explore further potential benefits and methods of practicing REBT within sport settings.

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