The effects of REBT and the novel use of credos on irrational beliefs and resilience in athletes"

Journal:	*The Sport Psychologist*
Manuscript ID	TSP.2016-0057.R1
Manuscript Type:	Article
Keywords:	exercise psychology, sport psychology, psychology

Note: The following files were submitted by the author for peer review, but cannot be converted to PDF. You must view these files (e.g. movies) online.

Table 3.odt
Example Credo from participant.odt

Abstract

The use of rational emotive behaviour therapy (REBT) in sport psychology has received little attention in research to date but is steadily growing. Therefore, to further aid the building body of research, this study examines the efficacy of REBT (comprising of five counselling sessions, and four homework assignments) in decreasing self-reported irrational beliefs (iBs) and raising self-reported resilience levels in five elite squash players from Malaysia using a single-case multiple-baseline across-participants design. Visual and graphical analysis revealed that REBT reduced self-reported iBs in all athletes and raised self-reported resilience levels in some athletes. Athlete feedback, reflections on the usage of REBT, credos, and practicing in Malaysia are discussed along with guidance for its future use in relevant settings.

Keywords: REBT; credo; applied sport psychology; resilience; irrational beliefs

The effects of REBT and the novel use of credos on irrational beliefs and resilience in athletes

Rational Emotive Behaviour Therapy (REBT) was developed in the 1950s by Dr. Albert Ellis, and is now prominent within the cognitive-behavioural family of therapies (Dryden & Branch, 2008). The foundation of REBT is derived from Ellis's interest in philosophy, and he adopted Epictetus' maxim "men are not disturbed by things, but by their view of things" (Still & Dryden, 1999, p. 146) to describe the underlying philosophy of REBT. REBT is distinguished from other therapies by suggesting that in response to adversity, dysfunctional emotions and maladaptive behaviours stem from irrational beliefs, with functional emotions and adaptive behaviours stemming from rational beliefs (e.g., Ellis & Dryden, 1997).

In the current theory there are four core irrational beliefs (iBs), which are demandingness (primary irrational belief), awfulizing, low frustration tolerance (LFT), and self/other/life depreciation (secondary irrational beliefs). Irrational beliefs are rigid, extreme, and illogical, and are associated with a vast array of maladaptive emotions and behaviours that could hinder short and long-term athletic performance (e.g., Dryden, 2009; Turner & Barker, 2014). For example, an athlete with the irrational belief that "I really want to succeed and therefore I must, and failure would be awful" is likely to experience anxiety (Unhealthy Negative Emotion; UNE: Dryden, 2011) and display avoidance behaviour. Rational beliefs consist of preferences (primary rational belief), anti-awfulizing, high frustration tolerance (HFT), and unconditional self-acceptance (secondary rational beliefs). Rational beliefs are flexible, non-extreme, and logical, and are associated with a vast array of adaptive emotions and behaviours 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 does not mean I must, and failure would be very bad, but not awful" is likely

to experience anxiety concern (Healthy Negative Emotion; HNE: Dryden, 2011) and display approach behaviour.

In essence, rational beliefs about adverse events (e.g., failure, poor treatment, rejection) help people to respond adaptively both emotionally and behaviourally. The ability to react adaptively to adverse situations has been captured within the construct of resilience. Also, recent work in the field of REBT (Dryden, 2007; Neenan, 2009) and resilience in sport (Fletcher & Sarkar, 2013) intimates that there exists some symmetry between REBT and the concept of resilience that may help to better understand and develop resilience (Turner, in press). 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). Adaptation to adversities has been repeatedly reported a key component of resilience in the literature (Galli & Gonzales, 2014; Gucciardi, 2011; Morgan et al., 2013; Sarkar & Fletcher, 2013), 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." In addition, "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." (Neenan & Dryden, 2011, p. 13). Indeed, recent literature concerning resilience training programmes include suggestions that a central element should focus on minimizing catastrophic thinking, challenging counterproductive beliefs, and cognitive restructuring (Fletcher & Sarkar, 2012) all of which are prominent within REBT (e.g., Schinke & Jerome 2002; Schinke, Peterson, & Couture,

2004). Thus, helping athletes to develop rational beliefs and reduce iBs may be a valuable method for enhancing resilience.

The efficacy of resilience-enhancing programmes within sport is still unknown, with the majority of programmes so far being within military (e.g., Jarret, 2008; Jarret, 2013) and education domains (Galli & Gonzales, 2014). The present study applies one-to-one REBT with athletes primarily to enhance self-reported resilience by reducing iBs. In order to assess the effects of REBT on resilience and iBs, a single-case design is adopted. A recent review of resilience research in sport (Galli & Gonzales, 2014) 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 and qualitative social validation data collection over time can provide necessary detail needed to more comprehensively assess resilience training, instead of a focus on performance data alone (e.g., Schinke et al., 2002).

Some past research that has applied REBT with athletes has also utilised single-case designs (e.g., Marlow, 2009; Turner, Slater, & Barker, 2015). For example, in one study Turner and Barker (2013) used a multiple-baseline across-participants design to examine the effects of REBT on the iBs and anxiety of four youth cricketers. Data was collected over a 17-week period and showed that iBs were reduced at intervention onset in all athletes, while cognitive anxiety we reduced in three. Despite notable examples (Bernard, 1985; Turner & Barker, 2013; Turner et al., 2015; Yamauchi & Murakoshi, 2001), 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). Therefore, the area remains under-researched and deserves further attention specifically in how REBT can be applied with varying athlete demographics both cross-culturally and across different sports.

The application of REBT with athletes has followed guidelines from REBT literature (e.g., Ellis & Dryden, 1997) and recent guidelines have emerged specific to athletes (Turner & Barker, 2014). The application of REBT is driven by a structured therapeutic process that follows an ABCDE framework, where adversities (A) are explored alongside emotional and behavioural consequences (C), with a view to uncovering the iBs (B) which drive emotions and behaviours. This process typically begins with rapport building and education with the athlete regarding the core structure and presumptions of REBT. Irrational beliefs are then disputed (D) and replaced with rational beliefs, promoting new functional emotions and adaptive behaviours (E). Rational beliefs are then disputed to ensure they are indeed rational and the athlete is assisted in imbedding an overall rational philosophy to life.

As part of this imbedding and reinforcement process, Athlete Rational Resilience Credos (ARRC) have been used (Turner, in press), drawing 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 typically reflect rational beliefs and desirable consequences (behaviours, emotions, and cognitions). There are a vast array of techniques used within REBT, many of which are is under-researched. Therefore, this study reports and examines the use of ARRCs to support the 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 resilience in athletes (e.g., Turner, in press). In addition, both REBT and resilience literatures are growing in sport (Turner, 2014), but no study has yet examined whether and how REBT may enhance the resilience of athletes. Therefore, the primary purpose of this study is to examine the effects of REBT on the irrational beliefs and resilience of elite athletes based in Malaysia using a single-case design. The use of REBT in South East

Asian populations is also under-represented within current literature, as the majority of research is completed with Western sample such as those in the United States of America and the United Kingdom (Dryden & Branch, 2008). In addition, this study applies ARRCs with the athletes to support REBT, a thus far under-researched technique that has recently been recommended for use with athletes (Turner, in press). Based on past research and commentary, it was hypothesised that REBT would decrease the irrational beliefs and increase the resilience of 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 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) national 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 received sport psychology support prior to the intervention, which consisted mainly of the canon of mental skills training (Andersen, 2009). Athletes were selected after a needs analysis indicating high irrational beliefs and low resilience, and informed consent was also obtained. Ethical approval being granted from the university and ISN prior to any data collection.

Experimental Design

This study adopted a single-case, staggered multiple-baseline across-participants design (see Barker et al., 2011), which allows the onset of the intervention to be compared to stable baseline data for each participant collected prior to the intervention beginning. In this design, participants have varying amounts of baseline periods and receive the same intervention at different points in time, the intervention started for participant 1 in week 3 after 5 data points, participant 2 in week 4 after 7 data points, participant 3 in week 5 after 9 data points, participant 4 in week 6 after 11 data points and participant 5 in week 7 after 13 data points. This design allows changes in variables within the intervention period attributed to the intervention as a cause-effect relationship, as opposed to extraneous variables causing any changes in variables (Kazdin, 1982). The internal validity of this design is ensured by the multiple replications for the intervention delivered across participants (Barker et al., 2013). In addition, the Hawthorne effect is controlled for by illustrating that only when the intervention is applied does data shift in a hypothesised direction.

Measures

Irrational Beliefs. To assess the presence of irrational beliefs in athletes the Irrational Performance Beliefs Inventory (iPBI; Turner et al., 2016) was used. The questionnaire is designed for usage in performance settings (such as sport or business) and consists of 28-items, 7 for each primary (demands) and secondary (low frustration tolerance, self/other/life-downing, awfulizing) irrational beliefs. Responses are made on a 5-point Likert-scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). The iPBI provides five variables, one for each primary (DEM), and each secondary low frustration tolerance (LFT), awfulizing (AWF), and depreciation (DEP) irrational belief, and a composite score (COMP). The iPBI has been shown to have good criterion, construct, concurrent reliability (Cronbach's

α = 0.9; Turner et al., 2016). Composite scores were used in the screening process (Cronbach's α = 0.8).

Resilience. To assess resilience levels in athletes, a shortened 10-item version of the 25 itemed Connor-Davidson Resilience Scale (CD-RISC 10; Connor & Davidson, 2003) was used. The CD-RISC-10 was selected as it has shown to be suitable for measuring resilience in athletes and offers a user-friendly assessment of resilient qualities (Gucciardi et al., 2011; Cronbach's α = 0.83). 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 as a suitable to detect clinically important change in resilience levels and has been recommended for use in interventions in a recent review of resilience scales (Windle et al., 2011), and scored highly for internal consistency (Cronbach's α range between 0.7 and 0.95 in previous studies) and construct validity (at least 75% of results in accordance with hypotheses).

Social Validation. For studies adopting a single-case research design, it is recommended that social validation measures are also used at the end of procedures to supplement statistical data (Page & Thelwell, 2013). Statistics do not fully detail the efficacy of interventions, and social validation reveals rich data about socially important outcomes or goals of an intervention, and the intervention procedures carried out (Page & Thelwell, 2013; Barker et al., 2011; Kazdin, 1982). As such, social validation should focus around 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 semi-structured interviews additional to participant ratings of the intervention as a whole out of a score of 0 to 10 as recommended for social validation, and interviews are able to obtain detailed feedback (Page & Thelwell, 2013). In an effort to avoid bias, the practitioner conducted one out of five interviews, the other four interviews were carried out by a psychologist based in ISN.

Transcripts of interviews were made and triangulation procedures were carried out to ensure consistency in the transcripts and themes, which were deducted from them following guidelines of thematic analysis (Braun & Clarke, 2006) between the interviewer and the author. A deductive approach was chosen as opposed to an inductive approach due to specificity of research questions presented as the rationale for the current study.

Procedures

In order to ensure that an intervention to enhance resilience was appropriate for the athletes, a screening process took place inside the 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 were the lowest scoring in resilience levels. The selected athletes completed measures of the iPBI and CD-RISC 10 twice weekly, normally on a Monday and Thursday with reminders being sent with social desirability instructions via text message. Adherence to data collection was aided by the team sport psychologist who intervened when required. 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 post-intervention 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 (Turner & Barker, 2014), five REBT sessions lasting an hour each and four homework assignments were set, which were cognitive and behavioural in nature (Ellis & Dryden, 1997). There was one session per week.

The third session integrated the ARRC into the intervention. The ARRC shows a clear target to aim for in terms of achieving levels for resilience and can inspire or motivate athletes to adopt a rational philosophy of life. The ARRC was broken down into short sections, and the athletes asking were asked to read the credo to encourage discussion around the credo. The athletes were encouraged to highlight specific sentences of interest, and then these passages were discussed to ascertain its salience to the athlete. The ARRC was inspected in this way in order to discuss any ambiguity or misunderstanding before the athlete began to adopt the credo as part of their daily routines. Then the athletes were tasked with rewriting the ARRC in their own words, thus forming their own personal credo. As homework, athletes were set behavioural assignments to use the credo in real-life situations such as in training, matches, and situations outside of their sport. This was to encourage the usage of the credo and not just the intellectual understanding of the credo.

The fourth session consisted of a review of the previous three sessions and in particular the usage of the ARRC. The athlete was aided in identifying which parts of the credo can be used in specific situations, such as failure, and setbacks. Athletes were encouraged to use smaller passages of the credo as self-talk as a behavioural homework assignment. In addition, a cognitive assignment was set asking athletes to add additional content to the credo, or remove content, to refine the credo to meet their needs. In the fifth session a review was conducted of all previous sessions. The athlete was provided with hypothetical situations for which they applied REBT to ensure that athletes were able to use REBT independently. The session ended when the practitioner was satisfied that the athlete's ability to apply REBT effectively. Athletes reflected on real training and tournament experiences and were given time to talk themselves through the ABCDE format alone.

Treatment of raw data

Data were first visually inspected to determine whether REBT caused a change in IBs and resilience over a time-series, with visual analysis being a useful indicator to determine large and small effects (Ottenbacher, 1986; Nourbaksh & Ottenbacher, 1994). Visual inspection took place for each participant dependent variable of composite iBs (Figure 1) and resilience (Figure 2) and also descriptive statistics (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 pre-intervention and post-intervention 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 pre-intervention and post-intervention phases for iBs and resilience scores (see Table 1).

Graphical Analysis

To further determine intervention effects, graphical analysis was performed to aid visual analysis (Ottenbacher, 1986; Nourbaksh & Ottenbacher, 1994). Both parametric and non-parametric statistical methods to compare baseline to intervention phase data however there is no standard method for analysing single-subjects data (Post et al., 2012). 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 (Crosbie, 1993; Ottenbacher, 1986; Barker et al., 2011). A preliminary autocorrelation analysis was conducted on all dependent variables for each phase (except for Participant 1's data points where phases were analysed 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 resilience scores. When a significant level of

autocorrelation is present in data, transformational procedures can be applied to reduce serial dependency to non-significant 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 (White, 1974; Kazdin, 1982) is a method of quantitatively analysing data (Ottenbacher, 1986) which 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 & Harding, 1974; Ottenbacher, 1986). If the intervention had no effect, then data points in the intervention phase would still be split through the middle the celeration line. If this isn't the case, a basis for statistical testing using binomial tests (Ottenbacher, 1986). When using this approach, it has also been prescribed to analyse changes in trend (direction and acceleration/deceleration) along with level, for brevity, it has been chosen to concentrate on changes in slope (Table 2) for dependent variables coupled with binomial tests.

Results

Irrational beliefs and resilience

Participant 1. Participant 1 had 5 overlapping data points between phases for COMP iBs (Figure 1) and 6 overlapping data points between phases for resilience (Figure 2). For changes between pre-intervention to post-intervention phases in COMP iBs, participant 1 showed a 22% decrease (large effect size with $d = 1.20$) in DEM, a 27.24% decrease (large effect size with $d = 1.47$) in LFT, a 22.52% decrease (large effect size with $d = 1.01$) in AWF, an 18.02% decrease (large effect size with $d = 1.04$) in DEP, and a 22.76% decrease (large effect size with $d = 1.26$) in COMP scores. For changes in resilience between pre-intervention to post-intervention phases, participant 1 showed an increase of 25.83%

(medium effect size with $d = 0.73$). Changes in iBs occurred immediately after the onset of the intervention but resilience scores began to increase after the second session. Binomial tests demonstrated a significant decrease in iBs between phases ($p < .001$) and a significant increase in resilience scores between phases ($p < .04$). To conclude, descriptive statistics and visual analysis show that across phases a reduction in iBs and an increase in resilience occurred for Participant 1, and statistical analysis supports this inference. The follow-up data points for both iBs and resilience remained stable with the last data point within the post-intervention phase.

Participant 2. Participant 2 had 2 overlapping data points for COMP iBs between phases (Figure 1) and 4 overlapping data points between phases for resilience (Figure 2). For changes between pre-intervention and intervention phases in iBs, participant 2 showed a 47.71% decrease (large effect size with $d = 3.21$) in DEM, a 49.25% decrease (large effect size with $d = 2.93$) in LFT, a 48.47% decrease (large effect size with $d = 2.90$) in AWF, a 48.53% decrease (large effect size with $d = 3.41$) in DEP, and a 48.52% decrease (large effect size with $d = 2.90$) in COMP. For changes in resilience between pre-intervention and post-intervention phases, participant 2 showed a 55.14% increase (large effect size with $d = 2.03$). Changes in iBs occurred immediately after the onset of the intervention with a decrease in scores and resilience scores also followed a dip but began to increase after the first session. Binomial tests also demonstrated a significant decrease in iBs between phases ($p < .001$) and a non-significant increase in resilience levels, although a steeper slope of acceleration was found in the trend line for post-intervention resilience scores (Table 2). To conclude, descriptive statistics and visual analysis show that across phases a reduction in iBs and an increase in resilience occurred for Participant 2. Statistical analysis suggests the reduction in iBs is significant however the increase in resilience is non-significant. The follow up data points showed a further decrease in iBs when compared to the last data point of the post-

intervention phase and resilience remained stable with the last data point within the post-intervention phase.

Participant 3. Participant 3 had 3 overlapping data points for iBs between phases (Figure 1) and 8 overlapping data points between phases for resilience (Figure 2). It is noteworthy that participant 3's overlapping points for iBs occurred between the third and fourth session, which is unique in the current study as this is towards the end of the REBT intervention itself. For changes between pre-intervention and post-intervention phases in iBs, participant 3 showed a 32.2% decrease (large effect size with $d = 2.71$) in DEM, a 22.42% decrease (large effect size with $d = 2.00$) in LFT, a 33.90% decrease (large effect size with $d = 2.64$) in AWF, a 40.50% decrease (large effect size with $d = 3.11$) in DEP and a 32.70% decrease (large effect size with $d = 3.02$) in COMP. For changes in resilience between pre-intervention and post-intervention phases, participant 3 showed an 18.51% increase (large effect size with $d = 1.00$). Changes in iBs were immediate with a decrease in scores from the onset of the intervention, resilience scores followed an immediate decrease until after the second session when they began to increase. Binomial tests showed that a significant decrease in iBs occurred between phases ($p < .002$). To conclude, descriptive statistics and visual analysis show that across phases a decrease in iBs and that an increase in resilience occurred for Participant 3. Statistical analysis suggests the reduction in iBs is significant however the increase in resilience is non-significant. The follow up data points showed that iBs remained stable, and that resilience showed an upwards spike when compared to the last data points in the post-intervention phase.

Participant 4. Participant 4 had 5 overlapping data points between phases for COMP iBs (Figure 1) and 5 overlapping data points for resilience (Figure 2). For changes between pre-intervention and post-intervention phases in COMP iBs, participant 4 showed a 5.56% decrease (medium effect size with $d = .81$) in DEM, a 13.26% decrease (large effect size with

d = 1.63) in LFT, a 4.5% decrease (large effect size with *d* = .96) in AWF, a 13.86% decrease (large effect size with *d* = 1.56) in DEP, and a 9.47% decrease (large effect size with *d* = 1.47) in COMP. For changes in resilience between pre-intervention and post-intervention phases, participant 4 showed an increase of 21.34% (large effect size with *d* = 2.07). Changes in iBs occurred after the second session where iBs decreased, with resilience scores increasing immediately from the onset of the intervention. Binomial tests also demonstrated a significant decrease in iBs occurred between phases ($p < .01$) and that a significant increase in resilience scores occurred between phases ($p < .002$). To conclude, descriptive statistics and visual analysis show that across phases a reduction in iBs and an increase in resilience occurred for participant 4, and statistical analysis supports this inference. The follow up data points showed that iBs decreased and that resilience levels remained stable when compared to the last data points in the post-intervention phases respectively.

Participant 5. Participant 5 had 4 overlapping data points between phases for iBs (Figure 1) and 5 overlapping data points between phases for resilience (Figure 2). For changes between pre-intervention and post-intervention phases in iBs, participant 5 showed a 31.24% decrease (large effect size with *d* = 2.17) in DEM, a 27.5% decrease (large effect size with *d* = 1.97) in LFT, a 35.21% decrease (large effect size with *d* = 2.25) in AWF, a 30.41% decrease (large effect size with *d* = 1.97) in DEP, and a 31.11% decrease (large effect size with *d* = 2.16) in COMP. For changes in resilience from pre-intervention to post-intervention phases, participant 5 showed an increase of 39.76% (large effect size with *d* = 1.92). Changes in iBs occurred after the second session, and resilience levels dipped but then increased until the third session at which point resilience levels levelled off. Binomial tests showed that a significant decrease occurred in iBs between phases ($p < .001$) and a significant increase occurred in resilience scores between phases ($p < .04$). To conclude, descriptive statistics and visual analysis show that across phases a reduction in iBs and an increase in resilience

occurred for participant 5, and statistical analysis supports this notion. The follow up data points showed that both iBs and resilience remained stable after the last data points of the post-intervention phase.

Social validation data

Guidelines set by Braune & Clarke (2006) were followed in a linear and recursive fashion to thoroughly analyse the qualitative data thematically. Five themes were collated from the social validation interview transcripts and examples are presented.

For the first theme of "well-being and emotional control", it was consistent across all five participants that well-being and emotional control was enhanced directly from the REBT intervention. Participant 1 reflected on a recent injury he had just suffered from "when I incurred my (recent) injury, I don't feel so down", and Participant 2 claimed they learned "how to control my emotions". Participant 4 cited that their favourite part of the intervention was the "little I" exercise (for self-acceptance) in which she claims she "learnt how to feel better about myself", and that the REBT helped her to "understand myself more…like the root of my problems…because sometimes you don't know why you feel a certain way".

For the second theme of "ability in handling adversities effectively", all participants confirmed that they believed 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" and Participant 3 showed a similar response in that he could "handle the losses better" and that he "bounces back faster (than before)". Additionally, Participant 3 presented a new strategy for handling adversities, "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". Participant 5 reported a decrease in "negativity"

and an increase in "positivity" when faced with adversities, which were performance based, and her general outlook on life.

For the third theme of "changing to rationality/flexibility and the benefits", all participants strongly confirmed they hold 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". Participant 5 commented that becoming flexible had "helped me a lot".

For the fourth theme of "feedback on credos and their usage", the responses were highly mixed. Participant 1's favourite part of the whole intervention was creating the credo, but suggested the traditional form of REBT helped him more than the credo but he still had faith in it's effectiveness, "if I read it everyday then it will help me", "if you're faced with adversity, if you often read that credo, you won't feel so bad. You will feel better." Favourable comments were given about the usage of IRC from Participant 2, such as "when I'm having a little stress or some anger…or some emotions I will read it". It must also be mentioned that although the credo was deemed effective, Participant 2 felt it was not necessary to instil flexibility, and that REBT was impactful without using and creating a credo. Participant 3, 4 and 5 had not created a credo and provided comments that the IRC was confusing, lengthy, and difficult to recall. Participant 4 suggested that the IRC 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 were unique, interesting and helpful. Participants enjoyed the sessions, however Participant 3 felt that 2 sessions would have been enough and Participant 5 requested more sessions. Regarding questionnaire completion, mixed responses were given, with Participant 1 and Participant 3 showing potential order effects and suggesting they already knew they

what to answer before completing the questionnaires, and that questionnaire completion was "annoying". Participant 4 and 5 both praised taking data samples twice a week in that it reminded them about the intervention and to be self-aware.

Respectively, participants gave the intervention and 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 and gained more from the intervention.

Discussion

This study is the first to examine the effects of REBT on irrational beliefs and resilience in athletes. Although past research suggests a link between rational beliefs and resilience (e.g., Neenan & Dryden, 2011; Sarkar & Fletcher, 2013), the present study is the first to apply REBT for the purposes of enhancing resilience. Further, the present study applied the ARRC as part of the REBT intervention for the first time in research literature. The ARRC has been advocated for use with athletes to enhance resilience (Turner, in press) but the present study is the first to examine its usage empirically. It was hypothesised that REBT would reduce iBs and increase self-reported resilience of elite Malaysian athletes.

Data analyses supports the hypothesis that REBT would decrease iBs. Visual analysis displays that all participants experienced a substantial reduction in iBs 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 all participants, and the shift to flexible beliefs was apparent in all participants in social validation data. The two athletes that demonstrated the largest reductions iBs (participants 1 and 2) had the first and third largest change in slope for iBs, and were the only athletes to complete all homework assignments, creating their own ARRCs (see supplementary material for an example).

Data analyses also supports the second hypothesis that REBT would increase self-reported resilience. This is the first study to report increases in resilience following REBT, and supports the notion that REBT can be an effective intervention for promoting resilience suggested in past literature (e.g., Neenan & Dryden, 2011; Turner, in press). Visual analysis indicates that all participants demonstrated an increase in resilience, however graphical and statistical analysis show that three of the five athletes (participants 1, 4 and 5) incurred substantial and significant increases in resilience when REBT was introduced. Participants 3 and 4 showed smaller increases in resilience. In addition, this study adopted the use of celeration lines as part of the data analyses, a rarely used method in sport and exercise psychology research. Celeration lines are useful for displaying the 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 angle of slopes (Barker et al., 2011).

For participant 1 and 2, a lesser amount than the recommended 8 baseline points was used and this may impact in accurate inspection of visual and graphical data (Ottenbacher, 1986). Participant 2 also displayed high variability in baseline data with two consecutive data points having a gap of 13, which is extremely large considering the CD-RISC 10 has a maximum score of 40. As such, variability of this magnitude may have impacted on the calculation and creation of celeration which binomial tests were conducted on. Therefore, participant 2's graphical data should be treated with caution.

Social validation data revealed perceived changes in behaviours, coping strategies, and outlook for participants. The thematic analysis and semi-structured interviews were advantageous, and the data obtained showed that REBT was a worthwhile, interesting, and useful intervention for which to be a part of. Credos, homework tasks and questionnaires received mixed feedback however sessions and REBT structure were typically well received.

The finding that self-reported resilience increased following the REBT intervention can be explained in several ways. REBT aims to reduce iBs and promote rational beliefs, with belief considered by some to be "the heart of resilience" (Dryden, 2011, p.130). Therefore, shifts in beliefs towards rational beliefs could facilitate in increase in perceived resilience. For example, increased HFT, and reduced LFT, is consistent with the notion that resilience stems from flexibility and rationalisation (Neenan & Dryden, 2011; Dryden, 2011), with individuals encouraged to believe that "I can handle this situation, I have handled worse things before", rather than "I cannot handle the situation." In addition, the rational beliefs that adversity is bad but not "awful" is likely to help athletes recover more quickly from feelings of hurt or sadness. Moreover, the central tenet of REBT that emotions and behaviours are driven by beliefs rather than events may instil a greater sense of control in athletes, which has been linked to resilience in past literature (e.g., Sarkar & Fletcher, 2014; Turner & Barker, 2013). Further investigation into how each specific irrational and rational beliefs relates to resilience is certainly warranted to uncover which beliefs drive resilience more than others.

There are some study limitations present, that if addressed would strengthen the findings. First, sport psychology literature lacks a sport-specific measure of perceived resilience. Although the CD-RISC 10 has been used in sport settings, a sport-specific measure of resilience would be advantageous as psychometrics should consider situational factors in measurement of constructs (Ziegler & Horstmann, 2015). Second, only one follow-up measure was taken due to the time constraints of the organisation. Although this timepoint does provide a marker for longer-term change, it does not allow for further visual analyses using single-case methods. Studies wishing to assess long-term changes post-intervention should collect several (8 per phase; Ottenbacher, 1986) follow-up measures. Finally, social validation interviews were conducted by a practitioner known to the athletes, potentially

leading a participant to provide socially desirable and biased responses. Future studies should consider using a third party unknown to the participants to conduct the interviews.

Despite the limitations, the current study satisfies calls for research within resilience building programmes (Galli & Gonzales, 2014; Dryden, 2007), was able to engage an elite sample of athletes, used complex and robust single-case methods, employed a needs analysis as is typically in applied practice (e.g., Marlow, 2009), and includes quantitative and qualitative data to examine the intervention effects. In addition, this study includes data on the perceptions of REBT from the participating athletes. The later data revealed that the intervention procedures were generally well accepted, and this is reflected in the high ratings given by the participants (M = 7.4, *Range* = 7-8, out of 10) for the programme. However, related to the design of the study, 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 become burdened 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.

A notable strength of the present study is the Malaysian sample that received the intervention. The majority of research applying REBT with athletes has recruited U.K. or U.S. samples of athletes (Turner, 2014), with some notable exceptions of a male Olympic medal winning table-tennis player from Hong Kong (Si & Lee, 2008) and 11 Japanese female high-school soft-ball players (Yamauchi & Murakoshi, 2001). It is imperative to consider cultural variances when applying REBT techniques such as empirical, logical and pragmatic questioning as part of disputation (Turner & Barker, 2013) as the way in which the practitioner achieves this should account for cultural variations, for example the considering the level of directness when communicating and making points. When practicing sport psychology across cultures, it is also vitally important to remember the very fabric of which

people conduct themselves and how opinions are formed are of a totally different perspective and for a sport psychologist to be successful in a different culture they must immerse themselves first (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. In particular, a comparison between using REBT with Malaysian elite athletes and surrounding nations within South-East Asia would add greatly to the literature as of the authors current knowledge REBT usage in the region has not been reported.

Another important purpose of the current study was to critically reflect on the application of the ARRC for the first time in research literature. The credo requires a deep understanding of REBT to aid the full interpretation of the flexible rational beliefs presented. In this study, some athletes felt discouraged reading such a text all at once. Thus, specific sections of the credo were presented separately and inspected, rehearsed, then adopted for coaching of flexible beliefs. Also, and particularly pertinent to the present sample, the ARRC contains a very high level of English, problematic because for many of the athlete English is was their third tongue behind languages such as Malay, Mandarin, Cantonese and Tamil. The author expended a significant amount of time explaining several words within the credo to athletes and this maybe a reason why the credo received equivocal feedback from athletes. Therefore, practitioners who wish to use credos in the aid of REBT should devise their own and present these to clients and athletes at a level more easily comprehended.

The aim of the current study was to examine the efficacy REBT with athletes in reducing iBs and increasing resilience levels, and to report the use of the ARRC for the first time. Data has provided evidence that REBT successfully reduced iBs and some promise for REBT as a potential strategy to enhance resilience levels in athletes. In addition, the ARRC

shows some 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 of using REBT within the sport domain.

References

Andersen, M.B. (2009). The 'canon' of psychological skills training for enhancing performance. In K.F. Hays (Ed.) *Performance psychology in action* (pp.11–34). Washington, DC: American Psychological Association

Barker, J. B., McCarthy, P. J., Jones, M. V. & Moran, A. (2011). *Single-case research methods in sport and exercise psychology*. London: Routledge

Barker, J. B., Mellalieu, S. D., McCarthy, P. J., Jones, M. V., & Moran, A. (2013). A review of single case research in sport psychology 1997-2012: Research trends and future directions. *Journal of Applied Sport Psychology*, *25*, (1), 4-32

Bernard, M.E. (1985). A rational-emotive mental training program for professional athletes. In A. Ellis & M.E. Bernard (Eds.) *Clinical applications of rational-emotive therapy* (pp.227–309). New York: Plenum.

Braun, V. & Clarke, V. (2006) Using thematic analysis in psychology. *Qualitative Research in Psychology*, *3*, 77-101

Connor, K. M., & Davidson, J. R. T. (2003). Development of a new resilience scale: The Connor-Davidson resilience scale (CD-RISC). *Depression and Anxiety*, *18*, 76–82.

Dryden, W. (2007). Resilience and Rationality. *Journal of Rational-Emotive & Cognitive-Behavior Therapy*, *25*, (3), 213-226.

Dryden, W. & Branch, R. (2008). *The fundamentals of rational-emotive behavior therapy*. Chichester: Wiley

Dryden, Windy. (2009). *How to think and intervene* like an REBT therapist. London: Routledge.

Dryden, W. (2011). Understanding Psychological Health: The REBT Perspective. New York: Taylor & Francis

Ellis, A. (1994). The sport of avoiding sports and exercise: A rational emotive behavior therapy perspective. *The Sport Psychologist*, *8*, 248-261.

Ellis, A. & Dryden, W. (1997). *The practice of rational-emotive behavior therapy*. New York: Springer.

Fletcher, D., & Sarkar, M. (2012). A grounded theory of psychological resilience in Olympic champions. *Psychology of Sport and Exercise*, *13*, 669–678.

Fletcher, D., & Sarkar, M. (2013). Psychological resilience: A review and critique of definitions, concepts, and theory. *European Psychologist*, *18*, 12–23.

Galli, N., & Vealey, R. S. (2008). "Bouncing back" from adversity: Athletes' experiences of resilience. *Sport Psychologist*, *22*, 316–335.

Galli, N., & Gonzales, S. P. (2014). Psychological resilience in sport: a review of the literature and implications for research and practice. *International Journal of Sport and Exercise Psychology*, *13*, (3), 243-257.

Gangyan, S., Lee, H. (2008). Is it so Hard to Change? The Case of a Hong Kong Olympic Silver Medallist. *International Journal of Sport and Exercise Psychology*, *6*, 319-330.

Gucciardi, D. F., Jackson, B., Coulter, T. J., & Mallett, C. J. (2011). The Connor-Davidson resilience scale (CD-RISC): Dimensionality and age-related measurement invariance with Australian cricketers. *Psychology of Sport and Exercise*, *12*, 423–433

Hanrahan, S.J.(2011). Sport psychology services are multicultural encounters: Differences as strengths in therapeutic relationships. In Gilbourne, D., Andersen, M.B. (Eds) *Critical Essays in Applied Sport Psychology* (pp.145-156).

Hrycaiko, D., & Martin, G. L. (1996). Applied research studies with single-subject designs: Why so few? *Journal of Applied Sport Psychology*, *8*, 183–199

Jarrett, T. (2008). Warrior resilience training in operation Iraqi freedom: combining rational emotive behavior therapy, resiliency, and positive psychology. *The United States Army Medical Department Journal*, pp. 32–38

Jarrett, T.A. (2013). Warrior Resilience and Thriving (WRT): Rational Emotive Behavior Therapy (REBT) as a Resiliency and Thriving Foundation to Prepare Warriors and Their Families for Combat Deployment and Posttraumatic Growth in Operation Iraqi Freedom, 2005–2009. *Journal or Rational-Emotive & Cognitive Behavior Therapy*, *31*, 93-107.

Lazarus, A. (2006). *Brief but Comprehensive Psychotherapy: The Multimodal Way*. New York: Springer publishing Company Inc.

Lindner, H., Kirkby, R., Wertheim, E., & Birch, P. (1999). A brief assessment of irrational thinking: The shortened general attitude and belief scale. *Cognitive Therapy and Research*, *23*, (6), 651–663

Kazdin, A. (1982). Single-case experimental designs. In P. C. Kendall & J. N. Butcher (Eds.), *Handbook of research methods in clinical psychology* (pp. 461–490). New York: Wiley

Kazdin, A. E. (2011). *Single-case research designs: Methods for clinical and applied settings* (2nd ed.). New York: Oxford University Press

Marlow, C. (2009). Creating positive performance beliefs: The case of a tenpin bowler. In B. Hemmings & T. Holder (Eds.) *Applied sport psychology* (pp.65-87). London: Wiley

Morgan, P. B. C., Fletcher, D., & Sarkar, M. (2013). Defining and characterizing team resilience in elite sport. *Psychology of Sport and Exercise*, *14*, 549–559.

Neenan, M., Dryden, W. (2011). Understanding and developing resilience. In Neenan, M., Palmer, S (Eds.) *Cognitive Behavioural Coaching in Practice: an evidence based approach* (pp.133-152). London: Routledge.

Nourbakhsh, M.R., Ottenbacher, K.J.(1994). The statistical analysis of single-subject data: A comparative examination. *Physical Therapy*, *74*, 768-776.

Ottenbacher, K. J. (1986). *Evaluating clinical change: Strategies for occupational and physical therapists*. Baltimore: Williams & Wilkins.

Page, J., & Thelwell, R. (2013). The value of social validation in single-case methods in sport and exercise psychology. *Journal of Applied Sport Psychology*, *25*, (1), 61–71.

Persons, J.B. (1989). *Cognitive Therapy in Practice: A case formulation approach*. Norton; New York.

Roghanchi, M., Mohamad, A.R., Mey, S.C., Momeni, K.M., Golmohamadian, M. (2013). The effect of integrating rational emotive behavior therapy and art therapy on self-esteem and resilience. *The Arts in Psychotherapy*, *40*, 179-184.

Sarkar, M., & Fletcher, D. (2013). How should we measure psychological resilience in sport performers? *Measurement in Physical Education and & Exercise Science*, *17*, 264–280.

Schinke, R. J., & Jerome, W. C. (2002). Understanding and refining the resilience of elite athletes: An intervention strategy. *Athletic Insight*, *4*, 1–13

Schinke, R.., Peterson, C., Couture, R. (2004). A Protocol for Teaching Resilience to High Performance Athletes. *Journal of Excellence*, *9*, 9-18

Still, A., & Dryden, W. (1999). The place of rationality in Stoicism and REBT. *Journal or Rational-Emotive & Cognitive Behavior Therapy*, *17*, 143-164.

Taylor, J. (1994). On exercise and sport avoidance: A reply to Dr. Albert Ellis‘ article. *The Sport Psychologist*, *8*, 262-270.

Turner, M.J., & Barker, J.B. (2013). Examining the efficacy of rational-emotive behavior therapy (REBT) on irrational beliefs and anxiety in elite youth cricketers. *Journal of Applied Sport Psychology*, *25*, (1), 131–147.

Turner, M. J. (2014). Smarter thinking in sport. *The Psychologist*, *27*, (8), 596-599

Turner, M.J. & Barker, J.B. (2014). Using rational-emotive behavior therapy with athletes. *The Sport Psychologist*, *28*, 75–90.

Turner, M. J., Allen, M., Slater, M. J., Barker, J. B., Woodcock, C., Harwood, C. G., & McFadyen, K. (2016). The development and initial validation of the irrational performance beliefs inventory (iPBI). *European Journal of Psychological Assessment*, published online 22nd April 2016. doi: 10.1027/1015-5759/a000314

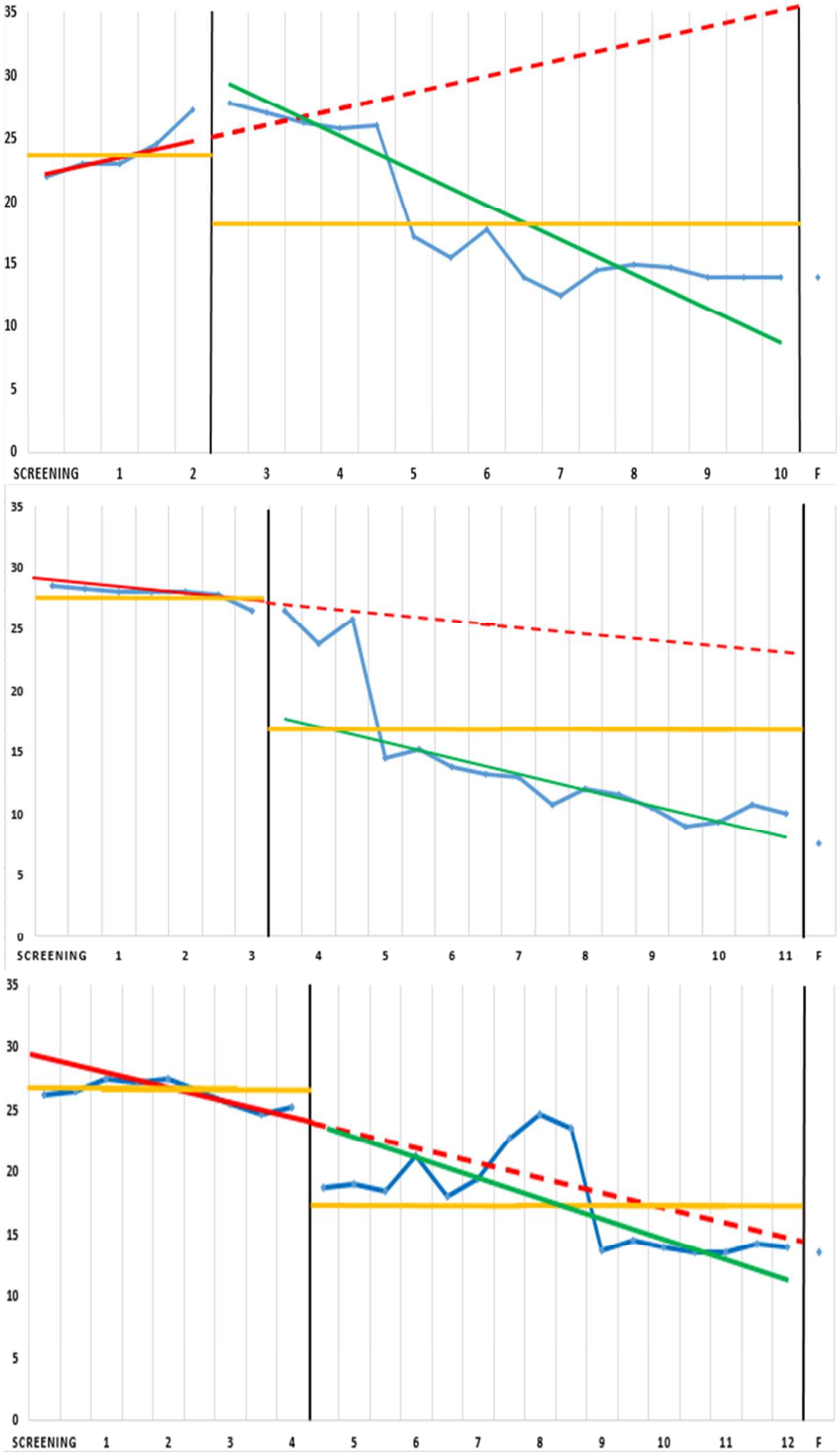
Windle, G., Bennett, K. M., & Noyes, J. (2011). A methodological review of resilience measurement scales. *Health & Quality of Life Outcomes*, *9*, 8–25.

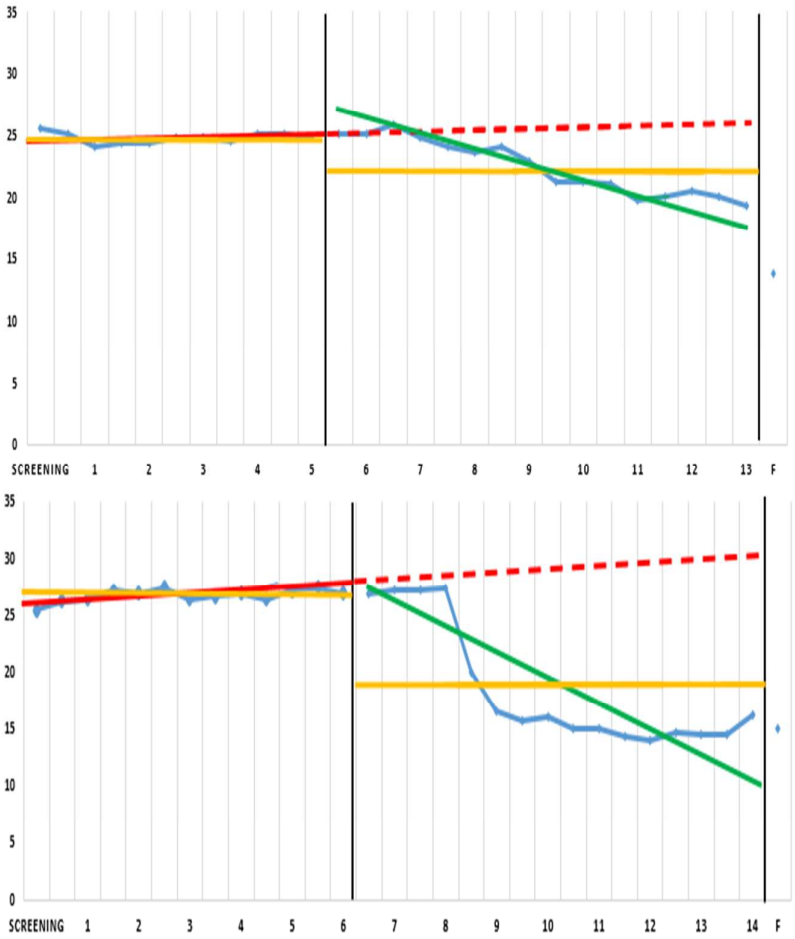
Wolf, M. W. (1978). Social validity: The case for subjective measurement or how applied behavior analysis is finding its heart. *Journal of Applied Behavior Analysis*, *11*, 203–214.

Ziegler, M., & Horstmann, K. (2015). Discovering the second side of the coin Integrating situational perception into psychological assessment. *European Journal of Psychological Assessment*, *31*, 69-74.

Zinsser, N., Bunker, L., Williams, J.M. Cognitive techniques for building confidence and enhancing performance. In Williams, J.M (Ed) *Applied Sport Psychology: personal growth to peak performance* (pp. 305-335). Mc-Graw Hill: London.

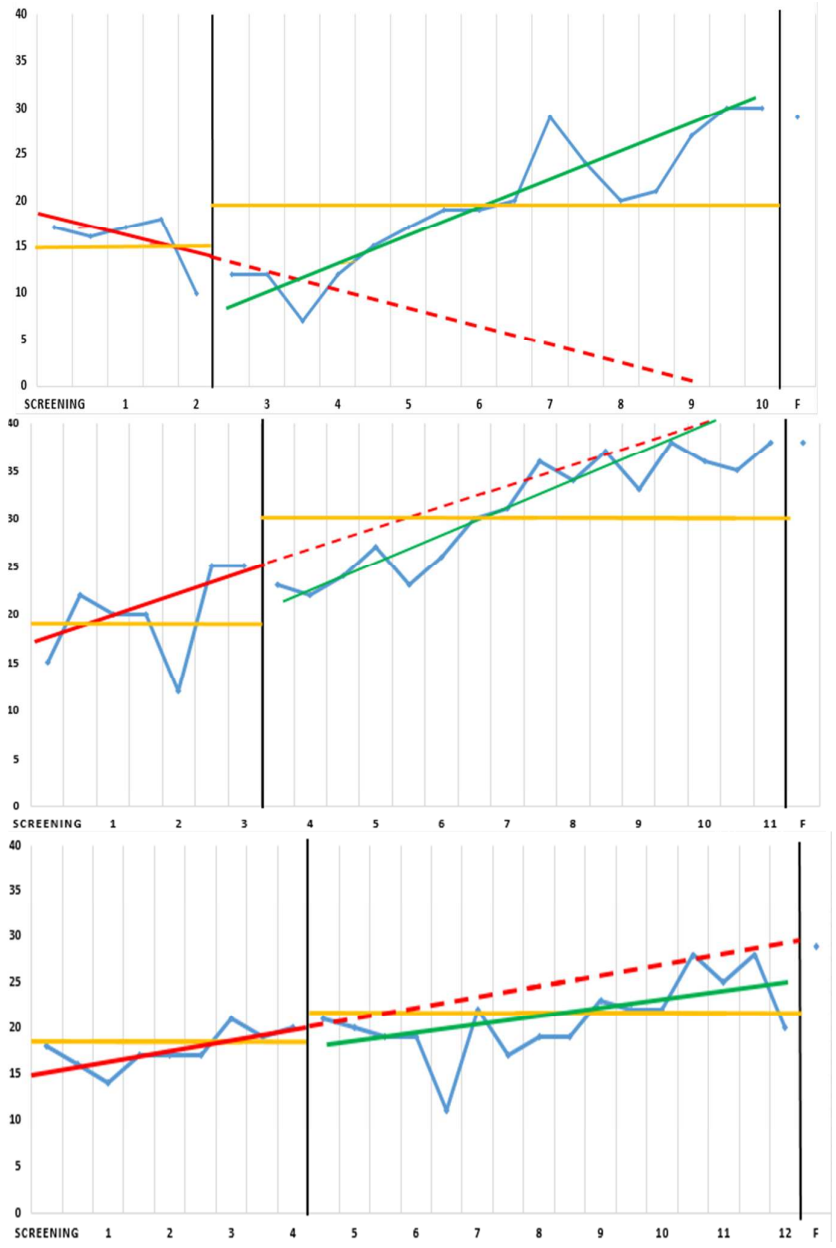
Figure 1. Graphed data for composite irrational beliefs across all phases.

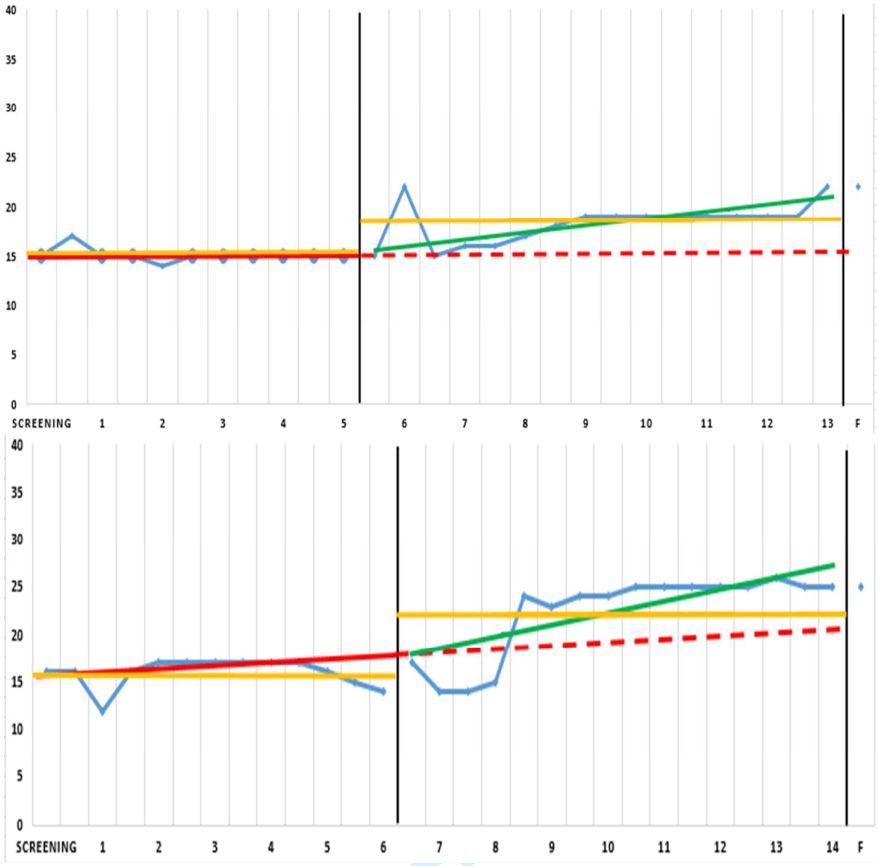




Graph Legend:
The blue line represents the actual data points in the time-series
The red line represent the celeration line for the pre-intervention phase
The dashed red line represents the predicted continuation of the celeration line in the intervention phase
The green line represents the trend line in the intervention phase
The yellow line represent the mean score for each phase
The black line represent the separation of phases

Figure 2. Graphed data for resilience across all phases.





Graph Legend:
The blue line represents the actual data points in the time-series
The red line represent the celeration line for the pre-intervention phase
The dashed red line represents the predicted continuation of the celeration line in the intervention phase
The green line represents the trend line in the intervention phase
The yellow line represent the mean score for each phase
The black line represent the separation of phases

Table 1.

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

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	x1.11	÷1.61	÷1.78	÷1.23	x2.43	x2.99
Participant 2	÷1.05	÷1.40	÷1.33	x1.44	x1.49	x1.03
Participant 3	÷1.17	÷1.42	÷1.21	x1.18	x1.12	x0.95
Participant 4	x1.01	÷1.16	÷1.17	1.00	x1.16	x1.16
Participant 5	x1.06	÷1.36	÷1.44	x1.10	x1.29	x1.17