

Final Version of Manuscript accepted from publication:

Outar, L., Turner, M., Wood, A., & Lowry, R. (2018, in press). "I need to go to the gym": Exploring the use of rational emotive behaviour therapy upon exercise dependence, irrational and rational beliefs. Performance Enhancement & Health. ISSN 2211-2669 ESN 2211-2669

## Final Draft

"I need to go to the gym": Exploring the use of rational emotive behaviour therapy upon exercise dependence, irrational and rational beliefs.

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Accepted: 22<sup>nd</sup> May 2018

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### Abstract

32 Extant research suggests that irrational and rational beliefs may play an important role  
33 in both substance and behavioural addictions. However, the influence of irrational and  
34 rational beliefs pertaining exercise addiction has yet to be investigated. Rational  
35 emotive behaviour therapy (REBT) is a cognitive-behavioural approach that provides a  
36 theoretical framework to identify and change irrational beliefs through cognitive  
37 restructuring and endorsing rational beliefs. The principal aim of the current study is to  
38 examine the effectiveness of a one-to-one REBT programme in decreasing irrational  
39 beliefs and exercise addiction symptoms, and increasing unconditional self-acceptance,  
40 in three male exercisers. The exercisers present high symptoms of exercise addiction,  
41 and high irrational beliefs. A single-case, staggered multiple-baseline across participant  
42 A-B design is used in the current study to examine the effects of a six-week REBT  
43 program comprising six 45-minute one-to-one counselling sessions and 5 homework  
44 assignments. Visual and statistical analyses, and social validation data indicate strong  
45 reductions in low-frustration tolerance, composite irrational beliefs, and exercise  
46 addiction from pre- to intervention phase. In addition, all participants report increased  
47 unconditional self-acceptance. This is the first study to report the effects of REBT in an  
48 exercise population, and the first to demonstrate that exercise addiction symptoms can  
49 be attenuated using REBT. This study supports literature suggesting that irrational and  
50 rational beliefs are an important mechanism in exercise addiction and provides  
51 important implications for the development of its treatment.

52 Keywords: Intervention; cognitive behavioral; case-study; rational beliefs; exercise

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56 “I need to go to the gym”: Exploring the use of rational emotive behaviour therapy upon  
57 exercise addiction, irrational and rational beliefs.

58 A large corpus of empirical evidence exists associating regular practice of physical  
59 exercise with a plethora of psychological and physical benefits (Bouchard, Sheppard, &  
60 Stephens, 1994). However, research has shown that, as with behaviours such as gambling or  
61 internet-use, the practice of physical exercise can acquire an addictive character (Sussman et  
62 al. 2011). In such cases, the person adopts a behavioural pattern that is meticulous, and  
63 inflexible, making it difficult to reduce intensity, frequency, or time committed to exercise,  
64 this occurs even in the presence of negative consequences such physical injury and  
65 disregarding social and professional obligations (Freimuth et al. 2011), in such instances of  
66 behaviour this relate to exercise addiction.

67 Exercise addiction is described as pathological pursuit of exercise behaviour, that is  
68 marked by psychological dysfunction in which exercise behaviour becomes out of control,  
69 compulsive and dependent, resulting in a plethora and psychological and physical  
70 impairments (Little, 1969, Szabo, Griffiths, & Demetrovics, 2016). At present, nosology of  
71 exercise addiction remains equivocal with no official diagnostic criteria, due to this very few  
72 documented cases have emerged. At present, the diagnosis of exercise addiction is largely  
73 determined by clinical judgment. Clinicians screen patients to identify underlying motivators  
74 pertaining to an individual’s exercise behaviour, emotional connection to exercise, and  
75 influence on other facets of their life. This information is then corroborated using a valid  
76 assessment tool (i.e. Exercise dependence scale; Hassenblas & Hassenblas, 2002b) to

77 ascertain the severity of exercise addiction symptoms. To this end, pathogenic exercisers (i.e.  
78 exercise addiction) can be discerned from high-frequency/or committed exercisers (i.e.  
79 healthy habit), like athletes or avid exercisers who maintain control over exercise, have  
80 meticulous training regimes, however maintain social and professional obligations, and  
81 encounter no deleterious or negative consequences as a result of their exercise practices.

82         Exercise addiction is often classified as a behavioural addiction (Egorov & Szabo,  
83 2013), analogous to gambling addictions. However, as it stands the DSM-5 in its subsection  
84 of “Non-substance-related disorders” includes only gambling addictions as a behavioural  
85 addiction (American Psychiatric Association, 2013), with exercise addiction residing as a  
86 “compensatory behaviour” of eating disorders such as Anorexia and Bulimia Nervosa.  
87 Consequently, scholars working in the area of exercise addiction have relied on theoretical  
88 models derived from two kinds of criteria: (1) those proposed and derived from the substance  
89 dependence subsection in the DSM-IV (American Psychiatric Association 1994, Hausenblas  
90 & Downs, 2002a, b) or (2) those proposed for behavioral addictions by Griffiths (1996,  
91 2005). Extant literature utilising both criteria, have proposed prevalence rates of 2-3% for the  
92 general exercising population (Mónok et al, 2012). However, endurance exercise populations  
93 have yielded prevalence rates of up to 20% (Griffiths et al. 2015).

94         De Coverley Veale (1987) discerned between primary and secondary exercise  
95 dependence. Primary exercise dependence entails pathological exercise behaviour which is  
96 driven solely for psychological gratification from exercise behaviour alone (Bamber,  
97 Cockeril & Carroll, 2000), whereas secondary exercise dependence relates to the use of  
98 exaggerated exercise as means to regulate and control another disorder (e.g. Anorexia  
99 Nervosa, Bulimia Nervosa). Thus, to avoid conceptual confound, when considering exercise  
100 addiction this paper will adopt a “primary” conceptualisation, therefore utilising Hausenblas  
101 & Symons-Downs (2002b) perspective to assess, describe and define exercise addiction. To

102 this end, exercise addiction is defined as “a craving for leisure time physical activity that  
103 results in uncontrollable excessive exercise behaviour that manifest physiological and/or  
104 psychological symptoms” (Hausenblaus & Symons-Downs, 2002b p. 90). Therefore, exercise  
105 addiction is marked by psychological, behavioural and social factors including: unhealthy  
106 exercise intensity/frequency, exercising more than intended, lack of control over exercise,  
107 withdrawal symptoms, a great deal of time pursuing exercise, reduction in other activities due  
108 to exercise, and continuing to exercise despite recurring physical and/or psychological  
109 problems.

110         Despite a large corpus of research investigating this phenomenon and its detriments,  
111 there remains a paucity of research identifying underlying mechanisms that contribute to the  
112 onset, development, and maintenance of exercise addiction. Moreover, scant attempts of  
113 treatment have been reported within literature, however, as with other behavioural addictions,  
114 cognitive behavioural therapy (CBT) has been recommended to help exercisers to reconstruct  
115 their maladaptive beliefs concerning exercise (Weinstein & Weinstein, 2014).

116         To date, etiology studies of exercise addiction have proposed both neurobiological  
117 and psychological explicative models (Weinstein and Weinstein 2014; Thompson & Blanton,  
118 1987; Szabo, 1995). Egorov and Szabo (2013) postulated that exercise addiction could  
119 manifest by utilising exercise as a coping mechanism arising from the interaction between  
120 adversity and one’s interpretation of such events. Once this coping method of stress is  
121 adopted, the individual becomes reliant on it to function adequately. Furthermore, the  
122 individual believes that he/she is engaging in a seemingly health behaviour for stress  
123 management given scholastic and public health resources, providing rationalization for their  
124 pathogenic exercise behaviour that begin to impede upon social and professional obligations.  
125 However, eventually when life-obligations forces the individual to reduce frequency of  
126 exercise bouts, causing exercise privation, consequently, psychological hardship resurfaces

127 and manifests as withdrawal symptoms (e.g. anxiety, depression, agitation, irritability).  
128 Moreover, theoretical postulates have highlighted psychological traits such as trait anxiety  
129 (Coen & Ogles, 1993), perfectionism (Cook, 1996), and obsessive compulsiveness (Spano,  
130 2001) as predispositions to the development of exercise addiction. Finally, Egarov & Szabo  
131 (2013) conceived the notion of a “black box”, relating to the idiographic mindset of an  
132 individual with exercise addiction. The black describes the possible interactions between  
133 personal and situational factors, which increase the onset, development and maintenance of  
134 exercise addiction. Key components of the black box entail ongoing, unbearable or suddenly  
135 appearing adversities (e.g. loss, break ups, bullying) which causes pain that the individual has  
136 no control over. This also interacts with attentional cognition in that prior experience, inter-  
137 and intra-personal thought, beliefs and conviction will influence exercise behaviour as means  
138 for escape path. Considering the aforementioned, one psychological construct that has been  
139 linked to the above, and thus could be valuable in understanding exercise addiction, is that of  
140 irrational and rational beliefs.

141         Derived from the postulates of rational emotive behaviour therapy (REBT; Ellis,  
142 1957), irrational and rational beliefs allude to cognitive pattern in which individuals holds in  
143 the face of adversity (rejection, failure, loss). Rational emotive behaviour therapy is a  
144 cognitive-behavioural approach to the promotion of psychological health and well-being, and  
145 postulates, that all disturbance occurs as a consequences of dysfunctional information  
146 processing (Ellis, 1962, 1994). REBT delineates between irrational (e.g., demandingness, low  
147 frustration tolerance, awfulizing, and self-, other-, or world-depreciation) and rational beliefs  
148 (e.g., preferences, high frustration tolerance, anti-awfulizing, and self-, other-, or world-  
149 acceptance; Ellis & Dryden, 1997), and adopts a binary theory of emotional distress,  
150 discerning between dysfunctional and functional emotions, thus being qualitatively different  
151 than quantitatively. Irrational processing to internal stimuli (e.g., a pain in your leg) or

152 external stimuli (e.g., receiving negative feedback) are hypothesised to produce unhealthy or  
153 maladaptive emotions reactions (i.e., UNEs; anxiety, rage, depression). In contrast rational  
154 processing of stimuli are hypothesised to produce healthy or adaptive emotional reactions  
155 (i.e., UNEs; concern, assertiveness, sadness). Beliefs are evaluative or appraisal mechanisms  
156 and are consistent with Albeson and Rosenberg's (1958) conceptualisation of hot cognitions.  
157 Beliefs evaluate representations of reality in terms of their personal significance to that  
158 individual. Therefore, the primary objective of REBT is to change irrational beliefs through  
159 cognitive restructuring, and to promote rational beliefs to propagate psychological health and  
160 well-being (Ellis & Dryden, 1997; MacInnes, 2004). Indeed, REBT holds that neurotic  
161 disturbances are a by-product of escalating one's rational, flexible, preferences into irrational,  
162 inflexible, demands. To this end, people develop our irrational beliefs by what they greatly  
163 desire. Furthermore, REBT posits that beliefs, irrational/and or rational, engender emotional  
164 experiences that create specific action tendencies. Thus, irrational beliefs facilitate behaviour  
165 tendencies to engage in escape or avoidant behaviours, contrarily rational beliefs generate  
166 emotions that facilitate approach behaviours (Ellis, 1994; Dryden, 2002). More precisely,  
167 Dryden delineates a gamut of behaviours/action tendencies associated with holding irrational  
168 beliefs, viz. withdrawing from reinforcement, isolation, avoiding feared situations, self-  
169 harming, searching for constant reassurance, repetitive behaviour, ignoring attempts to  
170 restore social equilibrium. Examples of overt operant behaviours include avoiding anxiety  
171 provoking situations because we have endorsed the belief that we must not experience it  
172 because to do so would be completely awful, and we could not stand it. Such postulates, may  
173 provide understanding to the psychological processes of an exercise addiction, with the  
174 exerciser holding irrational beliefs about the prospect of missing an exercise bout, and  
175 therefore displaying an array of unhealthy negative emotions (i.e. anxiety, guilt), and  
176 accompanying avoidance/safety behaviours (rigid programmes, missing social obligations,

177 training whilst injured). The theory and efficacy of REBT has received support (David,  
178 Szentagotai, Kallay, & Macavei, 2005) from within both clinical and non-clinical populations  
179 and with youth and adult samples (e.g., Turner, 2016; Visla, Fluckiger, Holtforth, & David,  
180 2016).

181         Extant research has positively associated irrational beliefs with substance (e.g.  
182 cocaine; Moller et al. 2007; Greven, 1985; Penn & Brooks, 2000) and behavioural addictions  
183 (e.g. Internet use and gambling: Petry et al. 2007; Young, 2007; Lupu & Lupu, 2013; Cardak,  
184 Koc, & Kolac, 2009). Indeed, Ellis (1994) in his only formal contribution within sport and  
185 exercise psychology literature highlighted the potential problem of overindulgence in  
186 exercise, remarking “like avoidance, overindulgence usually has strong elements of low  
187 frustration tolerance that sparks it and keeps it going. Thus, compulsive exercising and  
188 playing in sports often stems from irrational beliefs such as, "Because I like exercise [or  
189 sports] I should be able to participate in it all the time without harming myself. I can't stand  
190 limiting myself. It's awful if I'm restricted." (p. 258). To this end, REBT interventions  
191 fundamental goal would be to identify irrational beliefs in addictive behaviours that result in  
192 maladaptive emotions and behaviours (i.e. anxiety, guilt, substance abuse, gambling). More  
193 precisely, Ellis et al. (1988) postulated that treatment involves changing self-defeating  
194 thinking about discomfort and maintaining abstinence through development of high  
195 frustration tolerance (HFT), this contention was supported by Ko et al. (2008), highlighting  
196 Low frustration tolerance (LFT) as a principal antecedent of addictive behaviours. Low  
197 frustration tolerance is one of the central concepts in REBT theory and arises from beliefs  
198 that frustration (or discomfort) is unbearable and therefore must be avoided regardless of  
199 cost. Low frustration tolerance can be depicted in beliefs such as “things should be as I want  
200 them to be, I can't stand it when they are not,” and are considered to be driven by immediate  
201 gratification, at the expense of long-term damage (Ellis, 2002). In exercise addiction, this

202 relates to the individual's inability to reduce exercise intensity or stop exercise especially  
203 when medically prohibited, due to wanting to avoid the discomfort that exercise withdrawal  
204 brings (e.g. anxiety, depression, irritability). To date, only one study has highlighted the role  
205 of beliefs (rational) in exercise addiction. Halls et al. (2009) reported a relationship between  
206 rational beliefs and exercise addiction, holding that unconditional self-acceptance played a  
207 mediating role in exercise addiction, in that low levels of unconditional self-acceptance  
208 preceded high levels of exercise addiction. However, this study did not measure irrational  
209 beliefs. Past research has highlighted the importance of assessing both irrational and rational  
210 beliefs, because irrational and rational beliefs are relatively orthogonal, and low irrational  
211 beliefs do not necessarily mean high rational beliefs (i.e., they do not correlate highly; Ellis,  
212 David, & Lynn, 2010); therefore, the specific role of irrational beliefs pertaining to exercise  
213 addiction remains unknown.

214 In sum, exercise addiction represents a condition that poses a threat to physical and  
215 psychological health and wellbeing (e.g., Hausenblas & Symons-Downs, 2002b). At present  
216 there is a dearth of literature implicating potential underlying mechanisms that pertain the  
217 development and maintenance of exercise addiction. Furthermore, given exercise addictions  
218 complicated history establishing conceptualisation, definitions, and theoretical frameworks  
219 there remains a paucity of literature providing sound empirical approaches to its treatment,  
220 with mere mentions of suitable treatment methods (Weistein & Weistein, 2014).

221 Therefore, the current study aims to elucidate the influence of irrational and rational  
222 beliefs on exercise addiction (e.g., Ellis, 1994; Hall et al., 2009), and in doing so will  
223 examine the efficacy of an REBT intervention with exercisers reporting exercise addiction  
224 symptoms, using a single-case design in line with previous literature (e.g., Turner & Barker,  
225 2013). Providing examination of the effects of REBT on irrational beliefs (particularly low  
226 frustration tolerance), rational beliefs (particularly unconditional self-acceptance; USA), and

227 exercise addiction symptoms. To the researcher's knowledge, no research has examined the  
228 role of irrational beliefs upon exercise addiction, furthermore no research has intervened with  
229 exercise addiction symptoms. Thus, considering theoretical underpinnings, it was  
230 hypothesised that an REBT intervention will reduce irrational beliefs (particularly low  
231 frustration tolerance), increase Unconditional self-acceptance, and reduce exercise addiction  
232 symptoms, from pre- to intervention, with the effects remaining stable at follow-up.

## 233 **Method**

### 234 **Participants**

235 After liaising with a U.K. leisure centre based in the Midlands, verbal consent was  
236 attained to recruit participants from their facility. The participants were three of eleven  
237 volunteers that expressed an interest in taking part in a program that was advertised to bring  
238 greater self-awareness of exercise beliefs. Participants were three male exercisers ( $M_{age} =$   
239  $22.00$ ;  $SD = 1.73$ ; *Participant age*;  $p1 = 22$ ;  $p2 = 20$ ;  $p3 = 23$ ), with 3-5 years of gym  
240 experience ( $M_{exp} = 4.33$ ;  $SD = 1.54$ ), who were not engaged in any other sport or physical  
241 activity during the data collection for this study. Experience refers to exercising at or over the  
242 government exercise guidelines for physical activity (150-minutes of moderate intensity  
243 activity, and two muscle-strengthening exercise sessions per week). All participants reported  
244 that they exercised 4-6 times weekly, which entailed a mixture of aerobic and resistance  
245 training. Participants were selected using a screening process, which indicated that the three  
246 participants reported high exercise addiction symptoms (i.e., scoring at risk of exercise  
247 addiction or non-dependent symptomatic; Hausenblas & Symon-Downs, 2002), and high  
248 irrational beliefs scores (compared to adult norms; Turner et al., 2016). The ED-s  
249 classification postulates that less than 5% of individuals would be classified as at risk for  
250 exercise dependence, 62.5–62.6% as nondependent symptomatic and 30.6–33.8% as  
251 nondependent (Downs et al. 2004). Considering the postulations of Freimuth, Moniz, & Kim

252 (2011) four phase of the development of exercise addiction, at stage two (at-risk) occurs  
253 when individuals perceive the intrinsically rewarding benefits of regular exercise (i.e. mood-  
254 altering effects). Thus, considering the aforementioned, both exercise addiction risk and non-  
255 dependent symptomatic was considered suitable for selection given risk being high and ED  
256 diagnosis (<5%) being scant. Informed consent was obtained, and ethical approval granted  
257 from the University before all data collection.

### 258 **Design**

259         The study utilised a single-case, staggered multiple-baseline across participant A-B  
260 design (Barker, McCarthy, Jones, & Moran, 2011), which has been used in previous REBT  
261 research (Turner & Barker, 2013). Participants established a stable baseline (iPBI, EDS,  
262 USAQ) before the intervention onset, which is important because a stable baseline aids the  
263 establishment of whether any change (statistical, meaningful, or both) has occurred. The A-B  
264 design is a robust procedure for assessing effect of the intervention (i.e. REBT) on the target  
265 variables (i.e. exercise addiction, irrational beliefs, and USA), and it allows the practitioner to  
266 ascertain whether the intervention brought about change (Kazdin, 1982). REBT was applied  
267 sequentially across participants at different time points, to allow for changes in the dependent  
268 variables to be attributed to the intervention rather than extraneous variables (Kazdin, 1982).  
269 Specifically, participant 1 commenced the intervention phase in Week 4, participant 2 in  
270 Week 5, and Participant 3 in week 6. Through this design one would expect changes to occur  
271 in the target participant(s) only, with the participant's data in the baseline phase remaining  
272 stable (Barker et al., 2011).

### 273 **Measures**

274         **Irrational beliefs.** The irrational Performance Beliefs Inventory (iPBI; Turner et al.,  
275 2016) was used to measure irrational performance beliefs. The iPBI comprised 28-items that  
276 measure the four core beliefs (demandingness, awfulizing, low-frustration tolerance, and

277 depreciation), as well as providing a composite value (Comp) for all four core irrational  
278 beliefs. Participants are asked to indicate their agreement on the 28-items on a Likert-scale  
279 between 0 (*strongly disagree*) to 5 (*strongly agree*). The iPBI has shown construct validity,  
280 and correlates well with established irrational beliefs measures, and with anxiety, depression,  
281 and anger, demonstrating concurrent and predictive validity. For Comp, Cronbach's alpha  
282 coefficient displayed acceptable to excellent internal reliability ( $\alpha = .50$  to  $.99$ ).

283       **Exercise addiction.** The Exercise Dependence Scale-21 (EDS; Hausenblas &  
284 Symons-Downs, 2002a, 2002b) is a multi-dimensional measure used to establish individuals'  
285 risk of exercise dependence. It considers individuals risk by presence of exercise dependence  
286 symptoms and derives from the DSM-IV criteria for substance dependence (American  
287 Psychiatric Association, 1994). The scale includes 21 items grouped into seven subscales,  
288 which relate to different aspects of exercise dependence (tolerance, withdrawal, intention  
289 effect, lack of control, time, reduction in other activities and continuance). Participants rate  
290 items on a 6-item Likert-scale from 1 (*Never*) to 6 (*Always*), which allows for categorization  
291 as 'at risk', 'non-dependent symptomatic' or 'non-dependent asymptomatic' based upon their  
292 responses. 'At risk' categorization refers to potential exercise dependence, non-dependent  
293 symptomatic and 'non-dependent asymptomatic' refer to a lack of dependence however  
294 symptoms pertaining to dependence for the former. In this study participants one and three  
295 were categorised as "at risk" and participant two as "non-dependent symptomatic." The scale  
296 has been used in a plethora of research and has demonstrated content and concurrent validity.  
297 Furthermore, the ED-S has demonstrated adequate test-retest reliability. Cronbach's alpha  
298 coefficient displayed good to excellent internal reliability ( $\alpha = .86$  to  $.97$ )

299       **Unconditional self-acceptance.** The Unconditional Self-Acceptance Questionnaire  
300 (USAQ; Chamberlain & Haaga, 2001) is a 20-item scale with 11 reversed items. Participant's  
301 rate items on a 7-item Likert-scale from 1 (*almost always true*) to 7 (*almost always untrue*).

302 The USAQ has been used previously in sport (Cunningham & Turner, 2016), and measures  
303 the belief that one fully and unconditionally accepts oneself regardless of behaviour,  
304 achievement, approval, respect, or love from others (Ellis, 1977). Cronbach's alpha  
305 coefficient displayed low to good internal reliability ( $\alpha = .18$  to  $.76$ ). Whilst reporting of  
306 Cronbach's alpha is important, the reader should consider the alphas reported in this study  
307 cautiously due to the sample size used. Indeed, some suggest that a sample size of  $n = 30$   
308 (Yurdugül, 2008) or even  $n = 50$  (Javali, Gudaganavar, & Raj, 2011) is required for reliable  
309 Cronbach's alpha calculation.

310       **Social validation.** Social validation allows for the addition of subjective data as a  
311 supplement to objective data (Wolf, 1978). Furthermore, it allows the practitioner to ascertain  
312 participant satisfaction of the intervention which is important as it ties the intervention effect  
313 with the social context and guides future applied work (Storney & Horner, 1991). Social  
314 validation data were collected at the end of the follow-up phase to establish clinical  
315 significance of the intervention. A focus group format was utilised to collect qualitative data  
316 from all three participants with regards to the perceptions of intervention, delivery, and  
317 efficacy (Hrycaiko & Martin, 1996; Kazdin, 1982; Schwartz & Baer, 1991). The social  
318 validation focus-group was conducted by a third-person, not known to the participants, to  
319 minimize social desirability. The focus-group allowed for divulgence of their personal and  
320 joint experiences with reference to changes in the dependent variables and broader  
321 implications in life, furthermore the focus group involved topics which highlighted the social  
322 significance of goals, social importance of effects and social appropriateness of the procedure  
323 of the intervention, which are outlined as the key requirements for the evaluation of social  
324 validation (Page & Thewell, 2013).

325 **Data collection**

326 Data were collected over a five-month period. Participants were required to complete  
327 the iPBI, EDS, and USAQ twice a week during the baseline phase (3 weeks). Thereafter, the  
328 clients were required to complete the iPBI and USA twice per week through the intervention  
329 phase (6 weeks) and the follow up phase (2 weeks). The EDS was required to be completed at  
330 the start, middle and end of the intervention phase (week 1, 3, and 6) and at the end of follow  
331 up phase (research completion). The intervention took place in the private personal training  
332 consultation room of a leisure centre, that comprised conventional office amenities viz. desk,  
333 chair, white board, and television screens.

### 334 **Intervention**

335 The intervention comprised a six-week REBT program comprising six 45-minute one-  
336 to-one counselling sessions and 5 homework assignments (between each session) conducted  
337 by the first author. The first author was a 27-year-old male with a degree in psychology and  
338 Master of Science degree in sports and exercise psychology. Furthermore, he had undergone  
339 REBT training at the Albert Ellis institute at the University of Birmingham and was under  
340 supervision of a British Psychological Society (BPS) Chartered, Health Care Professions  
341 Council Registered, and REBT-trained sport and exercise psychologist (second author).  
342 Session agendas were planned prior to sessions and followed a pre-determined structure to  
343 ensure intervention procedural reliability across participants. Sessions adhered to guidelines  
344 within REBT literature (Dryden & Branch, 2008; Dryden & DiGiuseppe, 1990; Ellis &  
345 Dryden, 1997; Turner & Barker, 2014).

346 The program included three phases: education, cognitive restructuring, and  
347 reinforcement.

348 The *education phase* principle aim was to teach participants the fundamentals of  
349 REBT. Thus, participants were educated on how to identify beliefs (i.e. rational and  
350 irrational), differentiation between irrational (i.e. demands, awfulizing, low frustration

351 tolerance, self-depreciation) and rational beliefs (preferences, anti-awfulizing, high  
352 frustration tolerance, self-acceptance), and how such beliefs in the face of adversity  
353 (challenge, difficulty, upset) can create either unhealthy negative emotions (e.g. anxiety,  
354 depression, unhealthy envy) or healthy negativity emotions (e.g. concern, sadness, healthy  
355 envy). Furthermore, clients were educated that it was their beliefs (B) that determined their  
356 emotional and behaviour consequences (C), and not the event or adversity (A). In this phase,  
357 great emphasis was placed on accountability of emotional and behavioural responses. Thus,  
358 participants were taught that irrespective of the adversity, they can have autonomy over their  
359 beliefs, and therefore emotional and behavioural responses being either irrational  
360 (dysfunctional) or rational (functional). For example, participant 1 expressed irrational beliefs  
361 (B) regarding achievement (e.g. “I want to achieve, therefore I must achieve, it would be  
362 unbearable if I did not and I would be a complete failure”). In relation to exercise this  
363 manifested into anxiety (C) when missing exercise bouts(A), which led to avoidance  
364 strategies (C) including missing social/employment obligations and rigid exercise routines or  
365 over compensatory behaviour (exercising twice a day) when a bout was missed. A  
366 fundamental component of the ABCDE process is goal setting, in the form of beliefs,  
367 emotions and behaviour, thus, participants were asked to consider how they would like to  
368 respond (C), and how such change would aid their goals (e.g. exercise enjoyment, improved  
369 social life etc). For example, participant one wanted to not feel extremely anxious when  
370 missing an exercise bout, and subsequently adopt a plethora of avoidance strategies, rather,  
371 instead feel concerned/nervous and subsequently having a more flexible approach to exercise  
372 (e.g. attending social events even when conflicting with exercise regimes)

373         The *cognitive restructuring phase* (also known as disputation) is the most critical  
374 aspect of the intervention phase, this took place over two sessions. A core tenant of REBT  
375 when restructuring cognitions (i.e. irrational beliefs) is to assume that the adversity (A) is

376 correct, and therefore reconstruct the irrational beliefs held regarding the A rather than  
377 reconstruct the A (Ellis & Dryden, 1997), additionally rational beliefs are constructed and  
378 promoted, thus promoting healthy emotions, and adaptive behaviour. The practitioner  
379 followed a directive formulaic approach to reconstruct participant irrational beliefs, this  
380 process entailed three strategies based upon evidence (where is the evidence?), logic (does it  
381 make sense?), and pragmatics (is it helpful?) (DiGiuseppe, 1991).

382         The *reinforcement phase* entails rehearsal of new strategies and beliefs (i.e. rational  
383 beliefs). This occurred throughout the intervention and specifically in the latter stages. First,  
384 this is achieved through setting homework assignments to support self-awareness, self-  
385 reflection, and affirmations of its principles (Ellis & Dryden, 1997) Moreover, participants  
386 were educated an array of methods including cognitive, emotional, and behavioural methods  
387 to reinforce and internalize their rational philosophy. Cognitive assignments involved  
388 working through ABCDE self-help worksheets, reconstructing workbooks and creating  
389 rational self-statements. Emotive assignments included rational emotive imagery (REI  
390 Dryden, 1997), in which the client utilised imagery techniques to identify emotions and  
391 reconstruct cognitions to practice before real life application. Finally, behavioural  
392 assignments include testing rational philosophies in challenging situations. For example,  
393 participants were asked to go the gym however to not exercise and to simply stand by. This  
394 allowed participants to test their rational philosophies in the face of adversity (e.g. “I want to  
395 exercise, however that does not mean that I must”. Additionally, REBT encourages  
396 individuals to abandon self-rating and self-esteem, and instead invest in Unconditional self-  
397 acceptance (USA; Chamberlain & Haaga, 2001). Extant literature postulates the importance  
398 of USA in exercise addiction, thus, sessions emphasised to role of USA to support a rational  
399 philosophy. First, this was achieved by outlining the difference between self-esteem and  
400 USA. Second, by utilising Dryden’s (2009) Realistic USA Credo, to develop a tailored credo

401 in which the practitioner and participant worked in collaboration, this supported the  
402 comprehension, and investment of the construct. Finally, the final session included a review  
403 of the content to test the clients understanding of REBT. Here the practitioner used the  
404 method “rational reverse role-play” (RRR; Kassinove & DiGiuseppe, 1975), in which the  
405 practitioner became the participant and role-played an exerciser with irrational beliefs, while  
406 the participants identified, reconstructed and reinforced new effective rational beliefs.

## 407 **Results**

### 408 **Data analysis**

409 Visual analysis of the data was conducted to ascertain whether the REBT  
410 intervention brought about any meaningful changes upon the dependent variables (Bloom,  
411 Fischer & Orme 2009). The graphical display has adopted a single data point format to allow  
412 the data level between and within intervention phases to reveal intervention effectiveness  
413 (Franklin, Alison, & Gorman, 1996). Through graphical interpretation it is possible to  
414 determine whether a meaningful change in the data has occurred. Hrycaiko and Martin (1996)  
415 proposed that this can be achieved by (a) the immediacy of effect at intervention phase (b) the  
416 number of overlapping data points between the pre-intervention, intervention, and follow-up  
417 phases, and (c) the magnitude of the effect following the intervention. Visual analysis of low-  
418 frustration tolerance, composite irrational beliefs, and USA occurred for each participant  
419 using graphs and descriptive statistics. Low-frustration tolerance has been specifically  
420 examined due to its consideration as being fundamental in the development and maintenance  
421 of exercise dependence. Cohens *d* (1988) was generated, to allow indication of the effect size  
422 in changes between pre-intervention, intervention, and follow-up phase mean levels (Table  
423 1).

424 To further determine intervention effects, statistical analysis was performed to accompany  
425 visual analysis (Barker & Jones, 2008; Wolfe et al, 1982). Following relevant guidelines

426 (Ottenbacher, 1986), the data were assessed for serial dependency via autocorrelation  
427 analysis to ensure that the data qualified for parametric tests. Participant's dependent  
428 variables (irrational beliefs, exercise addiction, unconditional self-acceptance) were analysed  
429 for serial dependency, apart from participants 3's exercise addiction scores, as there were too  
430 few data points (< 10 data points; Ottenbacher, 1986). Autocorrelation analyses revealed  
431 significant autocorrelation in iPBI scores for participant 1 and 2, however not in participant 3  
432 (P1,  $r = 0.93$ ; P2,  $r = 0.86$ , P3,  $r = 0.66$ ), with all other data yielding non-significant  
433 autocorrelation in exercise addiction (P1,  $r = 0.58$ , P2,  $r = 0.42$ ) and USA (P1,  $r = 0.44$ ; P2,  $r$   
434  $= 0.50$ , P3,  $r = 0.36$ ). The autocorrelated data were rendered suitable for statistical analysis  
435 utilising guidelines for first difference data transformation (Ottenbacher, 1986), producing  
436 non-autocorrelated data for participant 1's and 2's iPBI scores, thus permitting statistical  
437 analysis, with the retention of original scores for visual analysis. The dependent variables  
438 (irrational beliefs, USA, and exercise addiction) were examined for changes across  
439 timepoints using independent-samples  $t$ -tests. For irrational beliefs and USA, for each  
440 participant two  $t$ -tests were performed (pre-intervention to intervention, and intervention- to  
441 follow-up). For exercise addiction, for each participant only one  $t$ -test was performed (pre-  
442 intervention to intervention) because the follow-up phase included only one exercise  
443 addiction data point. For statistical analyses, statistical alpha was set at  $p < .005$ , after  
444 Bonferroni correction (9 tests) and for brevity, only statistically significant  $t$ -tests are  
445 reported, raw data can be found in Table 1.

#### 446 **Low frustration tolerance**

447         The mean levels indicated that for low frustration tolerance beliefs, each participant's  
448 scores decreased from pre-intervention to intervention phases (Figure 1). Participants  
449 reported this change immediately after the first REBT session, and there was one overlapping  
450 data point for participant 1 and 2, and no overlapping data points for participant 3.

451 Furthermore, participant 1 showed a 19.87% decrease ( $d = 1.70$ ), participant 2 showed a 32%  
452 decrease ( $d = 3.03$ ) and participant 3 showed a 32.33% decrease ( $d = 2.92$ ), from pre-  
453 intervention to intervention phases. Moreover, participant 1 showed a 38.99% decrease ( $d =$   
454  $2.52$ ), participant 2 a 17.65% decrease ( $d = 1.19$ ) and participant 3 a 23.72% decrease ( $d =$   
455  $1.65$ ), from intervention to follow-up ( $M = 13.54$ ;  $SD = 2.10$ ) intervention phases.

456 Statistical analyses revealed that participant 3,  $t(15) = 5.05$ ,  $p = .001$ , reported a  
457 significant reduction in low-frustration tolerance from pre- intervention to intervention  
458 phases.

### 459 **Composite irrational beliefs**

460 The mean levels indicated that for composite data, each participant's scores decreased  
461 from pre-intervention to intervention phases. Participants experienced this change  
462 immediately after the first REBT session, additionally there were no overlapping data points  
463 for all three participants. Moreover, participant 1 showed a 21.00% decrease ( $d = 1.80$ ),  
464 participant 2 showed a 26.93% decrease ( $d = 4.15$ ) and participant 3 showed a 26.84%  
465 decrease ( $d = 2.73$ ), from pre-intervention to intervention phases. Participant 1 showed a  
466 41.12% decrease ( $d = 2.75$ ), participant 2 a 7.10% decrease ( $d = .82$ ), and participant 3 a  
467 14.36% decrease ( $d = 1.28$ ), from intervention to follow-up ( $M = 10.08$ ;  $SD = 1.37$ ) phases.

468 Statistical analyses revealed that participant 3,  $t(15) = 4.79$ ,  $p = .001$ , showed a  
469 significant reduction in composite scores from pre-intervention to intervention phases.

### 470 **Exercise addiction**

471 Mean levels indicated that for exercise addiction, participants' scores decreased from  
472 pre-intervention to intervention phases. Moreover, participant 1 showed a 23.28% decrease ( $d$   
473  $= 1.40$ ), participant 2 showed a 13.11% decrease ( $d = 1.78$ ) and participant 3 showed a 2.51%  
474 decrease ( $d = 1.25$ ), from pre-intervention to intervention phases. Moreover, participant 1  
475 showed a 55.00% decrease ( $d = 2.54$ ), participant 2 a 3.16% decrease ( $d = .49$ ) and

476 participant 3 a 2.84% decrease ( $d = 1.94$ ), from intervention to follow up ( $M = 2.84$ ;  $SD =$   
477  $.88$ ) phases.

#### 478 **Unconditional self-acceptance**

479 The mean levels indicated that for unconditional self-acceptance, each participant's  
480 scores increased from pre-intervention to intervention phases (Figure 3). Participants  
481 experienced this change immediately after the first REBT session, each participant  
482 experienced overlapping data points, participant 1 and 3 both experienced one overlap with  
483 participant 2 experiencing six overlapping data points. Participant 1 showed a 10.78%  
484 increase ( $d = -1.51$ ), participant 2 showed a 4.14% increase ( $d = -.92$ ), and participant 3  
485 showed a 3.29% increase ( $d = -.76$ ), from pre-intervention to intervention phases. In addition,  
486 the data illustrates that scores were upheld and slightly increased for USA from intervention  
487 to follow-up phase, for example participant 1 displayed a 5.9% increase, participant 2 a  
488 4.25% increase and participant 3 a 2.8% increase, from intervention to follow-up phases.  
489 Statistical analyses revealed that participant 1,  $t(16) = -3.38$ ,  $p = .001$ , showed a significant  
490 reduction in composite scores from pre-intervention to intervention phases.

491 In summary, visual and statistical analysis of the target variables indicated that REBT  
492 brought about meaningful reductions in low-frustration tolerance, composite irrational  
493 beliefs, and exercise addiction in all participants, changes from pre-intervention to  
494 intervention phases were particularly strong in all participants. In addition, all participants  
495 reported increased USA. Changes occurred from the introduction of REBT and therefore all  
496 changes that occurred can be attributable to the REBT sessions. Moreover, withdrawal (i.e.  
497 follow up phase) of the intervention resulted in further reductions in irrational beliefs,  
498 exercise addiction, and further increased in USA. Considering visual analysis guidelines  
499 (Hrycaiko & Martin, 1996), meaningful changes reductions were shown in low-frustration  
500 tolerance, composite irrational beliefs, and meaningful increases were shown in USA.

501 Specifically, for low-frustration tolerance, composite irrational beliefs, and USA, immediate  
502 effects occurred (within two data points) after REBT implementation, there were few  
503 overlapping data points between pre-intervention to intervention phases, and the target  
504 variables displayed a great magnitude of effect.

#### 505 **Social validation data**

506 Social validation data indicate that exercisers thought that the REBT intervention was  
507 significant to their social goals. Exercise played a fundamental role within their lives, thus  
508 possessing healthier, functional, and adaptive behaviours and emotions towards exercise was  
509 congruent with their own goals. Greater self-awareness of irrational beliefs (B) and  
510 subsequently the cognitive restructuring of such beliefs (D), followed by the promotion of  
511 rational beliefs (E) lead to such goals. For example, participant one commented that before  
512 the REBT intervention “I used to feel anxious or angry if I did not go to the gym, since the  
513 sessions now I feel more relaxed as I know that I do not need to come to the gym”, whilst  
514 participant 3 stated “It helped me identify the difference between rational and irrational and  
515 the consequences for each one and therefore I was able to promote the more rational side”.  
516 Exercisers greater awareness lead to reductions of irrational beliefs and promotion of rational  
517 beliefs, which consequently resulted in healthier exercise behaviours, this was supported  
518 through their responses in the iPBI, USAQ, and EDS. Furthermore, regarding the importance  
519 of these effects, social validation data suggested that exercisers deemed the REBT  
520 intervention important.

521 REBT provides emotional and behavioural control through progression of the  
522 ABCDE framework. This framework guides the client to a rational philosophy, which is  
523 embodied by greater quality of life through greater relations and fulfilment of goals. For  
524 example, participant one commented, “It helped me with my relationships, like with my  
525 girlfriend”, whilst participant three stated “I didn’t think it would help this much, when I’m at

526 work I no longer feel the need to be aggressive”. This again corroborated the responses from  
527 the iPBI and USAQ. Finally, in regard to appropriateness of the procedures, social validation  
528 data suggested that exercisers deemed the REBT intervention as appropriate. REBT stresses  
529 the importance of developing a therapeutic alliance and progression through the ABCDE  
530 framework. Exercisers expressed how the practitioner’s conduct aided the delivery of REBT  
531 and that the ABCDE framework was sufficient in reaching their therapeutic goals. For  
532 example, participant three commented “I felt that he cared and wanted us to be better and that  
533 he didn’t need us to be, but he wanted us to be”, whilst participant two stated “For me it was  
534 perfect, so I wouldn’t change a thing” and another “It gave you enough to go through it  
535 properly, I wouldn’t change it at all”.

536 In summary, social validation data suggested the REBT intervention brought about  
537 intentional changes to reduce irrational beliefs and increase rational beliefs, and this in turn  
538 promoted healthier exercise behaviour (i.e., reduction in exercise addiction symptom). Social  
539 validation indicated that REBT enhanced emotional and behavioural control that transferred  
540 outside of the exercise domain into general life. Specifically, exercisers perceived REBT to  
541 be socially important and helpful within their life and relationships with others. Finally,  
542 social validation data suggested that exercisers deemed REBT as appropriate, specifically the  
543 authors conduct and progression through the ABCDE framework.

#### 544 **Discussion**

545 The principal aim of this study was to explore the effects of an REBT intervention on  
546 reducing irrational beliefs, exercise addiction, and increasing unconditional self-acceptance in  
547 a sample of male exercisers. This is the first study to explore the postulates of the role of  
548 irrational and rational beliefs upon exercise addiction (Ellis, 1994; Hall et al., 2009),  
549 however, more importantly to identify potential framework for its treatment. As such, it was

550 hypothesised that an REBT intervention would decrease irrational beliefs and exercise  
551 addiction and increase unconditional self-acceptance.

552       The results from the visual and statistical analysis of the data indicate that REBT was  
553 effective in reducing irrational beliefs, exercise addiction and increasing unconditional self-  
554 acceptance from pre-intervention to intervention phases. These changes continued from  
555 intervention to follow-up phases, illustrating that REBT had a lasting effect on irrational  
556 beliefs, exercise addiction and unconditional self-acceptance at 4 weeks, follow up phase.  
557 The results were corroborated by social validation data indicating that all participants  
558 reconstruction in their exercise beliefs, consequently, changed their behaviour towards  
559 exercise.

560       Low frustration tolerance beliefs were postulated an important antecedent in  
561 behavioural addictions (Ellis, 1988, 2002; Ko et al. 2008). This study supported such notions  
562 highlighting the reduction of low frustration tolerance (and other beliefs) indeed brought  
563 about changes in exercise addiction symptomology. There are a variety of mechanism by  
564 which low-frustration tolerance beliefs may contribute to the development and maintenance  
565 of exercise addiction. Ellis (1994) conceived that the compulsive nature of exercise derives  
566 from the endorsement of beliefs such as “I want to go the gym, therefore I need to go the  
567 gym, if I were to not I could not stand it”, therefore an exerciser endorsing such beliefs when  
568 missing an exercise bout may appraise such situations as unbearable. Indeed, considering the  
569 aforementioned literature on the role of emotion generation of irrational beliefs, exercisers  
570 holding such appraisals may engage in safety or avoidance behaviours (excessive repetitive  
571 behaviour) which manifest as exercise addiction. For example, the injured exerciser may  
572 continue to exercise regardless of medial contradiction, as they believe they may not have  
573 relevant resources to cope with stressors other than exercise (Dryden, 2008). Therefore,  
574 feelings of anxiety, guilt may arise when the individual is forced to miss the gym. Thus, by

575 cognitive reconstruction of an exercisers beliefs (i.e., low-frustration tolerance) to rational  
576 beliefs (i.e. high-frustration tolerance), consequently, leading to more functional appraisals  
577 (e.g. I want to go the gym, however, that does not mean I must, thus, I can stand it if I do  
578 not), subsequently, this will generate adaptive emotions (i.e., concern, remorse), and in turn  
579 lead the accompanying adaptive behaviour (i.e. healthy exercise commitment).

580 Another important tenet of exercise addiction is the role of unconditional self-  
581 acceptance, implicated as a mediator in exercise addiction (Hall et al., 2009). The data  
582 reported increases in unconditional acceptance in all participants, with participant one  
583 experiencing significant increase. Therefore, the notions postulated by Hall et al. (2009) have  
584 been corroborated by this study highlighting the role of rational belief in exercise addiction.  
585 More precisely, the underlying notion of unconditional self-acceptance holds that individual's  
586 unconditional accept themselves despite unfavourable behaviours (e.g. missing exercise;  
587 Ellis, 1997). Therefore, exercisers endorsing depreciation beliefs such as “not exercising  
588 would make me a failure, loser, terrible person”, may engage in addictive exercise behaviours  
589 (e.g. continuance, tolerance, time) and when missing an exercise bout may suffer withdrawal  
590 symptoms (anxiety, irritability, agitation, insomnia), contrarily, an exerciser endorsing  
591 unconditional self-acceptance beliefs such as “missing an exercise bout would not make me  
592 a failure, nor determine my worth” are likely to engage in more adaptive behaviours (e.g.  
593 appropriate injury recovery, social engagement, non-compensatory exercise). The role of  
594 Unconditional self-acceptance is an important one, as it highlights the role of appraising  
595 one's worth in relation to important facets in one's life (i.e. exercise).

### 596 **Limitations**

597 The current study has some limitations that if addressed could strengthen the findings.  
598 First, this study lacked an objective measure of functional and dysfunctional emotions and  
599 behaviours. This omission occurred because although the notion of UNEs and HNEs is a

600 central element of REBT (Dryden, 2009), no accurate measure has emerged in literature. The  
601 authors decided against using a unitary measure of emotions (e.g., anxiety, anger, depression)  
602 due to the significant time already being spent by participants on completing questionnaire,  
603 and because the unitary measurement of emotions is not in keeping with REBT theory. As a  
604 result, it is not possible to accurately infer emotional changes in the current study. In addition,  
605 Hausenblas, Gauvin, Symons-Downs and Duley (2008) have suggested that positive and  
606 negative mood states may be independently influenced by exercise abstinence. Future  
607 research should be invested in developing an accurate measure of UNEs and HNEs for use in  
608 applied research. Moreover, whilst the present study brought some insight into the role of  
609 irrational beliefs (chiefly low-frustration tolerance), one cannot infer that a reduction in low  
610 frustration tolerance results in an increase in high-frustration tolerance, because irrational and  
611 rational beliefs are relatively orthogonal (Ellis, David, & Lynn, 2010); low irrational beliefs  
612 does not equate to high rational beliefs. At present, there is no contrasting rational version to  
613 the iPBI and there are very few rational beliefs questionnaires. Therefore, to enhance the  
614 rigorous investigation of the influence of cognitive reconstruction from irrational to rational  
615 beliefs, a rational performance beliefs inventory (measuring high frustration tolerance, anti-  
616 awfulizing, preferences, and acceptance) is warranted. Furthermore, objective measures of  
617 exercise behaviour were not measured. Hausenblas and Symons-Downs (2002b) pointed out,  
618 exercise behaviour is not a strong predictor of exercise addiction and given that there is no  
619 objective amount of exercise that is considered detrimental or harmful, inferences made  
620 would be fruitless. To be clear, the current study aimed to reduce exercise addiction  
621 symptomology, rather than deter exercise behaviour. Second, a caveat when intervening with  
622 exercise addiction is the role of cognitive biases. In this study, the researcher was not blind to  
623 research parameters and therefore the halo effect may have taken place, however to  
624 circumvent this bias, the researcher followed the ABCDE framework, and adhered to a

625 systematic approach to the intervention delivery, with general beliefs being the main foci of  
626 the discussion, rather than exercise beliefs per se. Indeed, the Hawthorne effect too could be  
627 influential, as participants may have deduced the natures of this study, however as stated  
628 before this study did not deter exercise behaviour and looked at beliefs in array of life  
629 spectrums (academia, relationships, exercise and occupational). Nevertheless, researchers  
630 should take caution to such biases when developing interventions and exploring potential  
631 underlying mechanisms.

632 Finally, although the design of the current study is line with single-case research  
633 guidelines, data from only three participants is considered who are demographically  
634 homogenous (males aged between 20 and 23). Therefore, the results of the current study are  
635 difficult to generalise to other populations. Although the effectiveness of REBT has been  
636 demonstrated a wide variety of populations (e.g., Turner, 2016), the same study with female  
637 exercisers may yield different results, given that primary exercise addiction is more prevalent  
638 in males (Costa et al., 2013). Therefore, researchers should conduct larger-scale cross-  
639 sectional studies examining the role of irrational and rational beliefs in exercise addiction  
640 across a wider range of samples and could also repeat the methods in the current study, but  
641 with different populations.

#### 642 **Conclusion**

643 To conclude, as far as the authors are aware the present study is the first to report an  
644 intervention to reduce the symptoms of exercise addiction, and the first to examine the effects  
645 of REBT on irrational beliefs in exercisers. The current study contributes to the growing  
646 literature in exercise addiction and adds to the body of literature concerning the use of REBT  
647 in sport and exercise settings (Turner & Bennett, 2018). The findings of this study suggest  
648 that irrational and rational beliefs may play an important role in exercise addiction (e.g. Ellis,  
649 1994; Hall et al., 2009) and supports recommendations for the treatment of exercise addiction

650 using cognitive behavioural therapy (Weinstein & Weinstein, 2014). This study has  
651 highlighted the role of beliefs in the maintenance of exercise addiction and provides  
652 practitioners and researchers with a framework to reduce irrational beliefs, increase rational  
653 beliefs, and reduce exercise addiction symptomology. It is hoped that this research will serve  
654 as a catalyst for further research into the deleterious effects of exercise addiction, the  
655 treatments for exercise addiction, and to assist exercisers in developing healthy beliefs  
656 regarding exercise.

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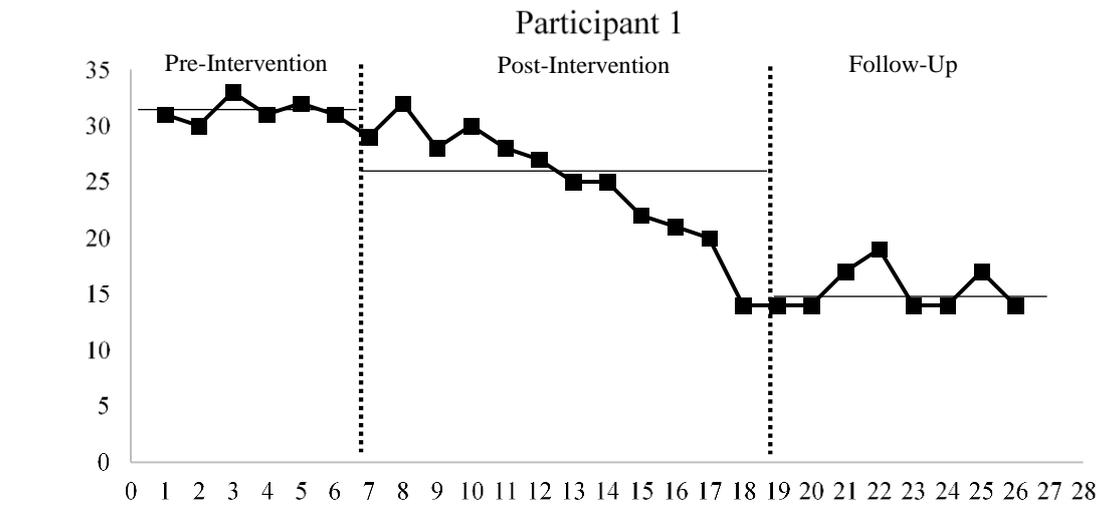
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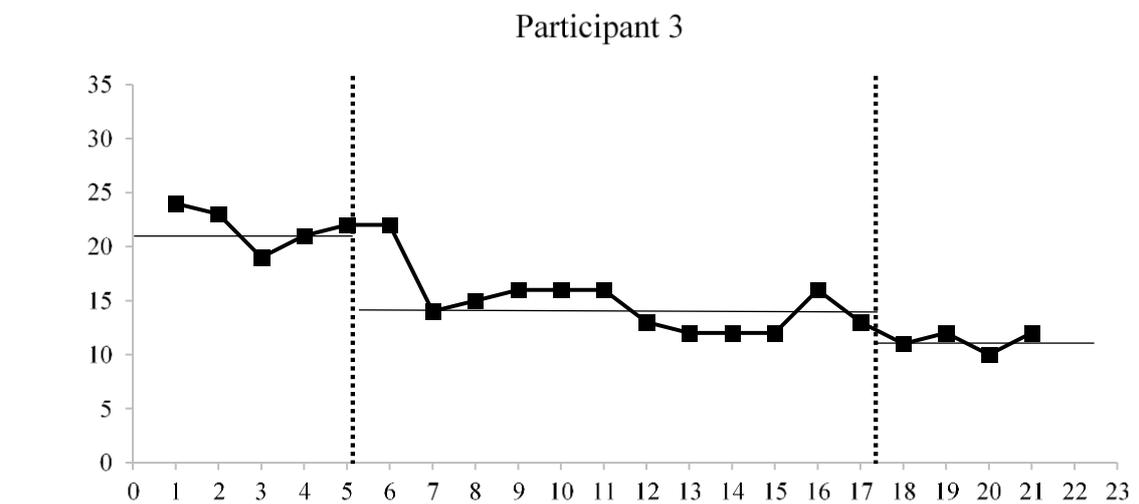
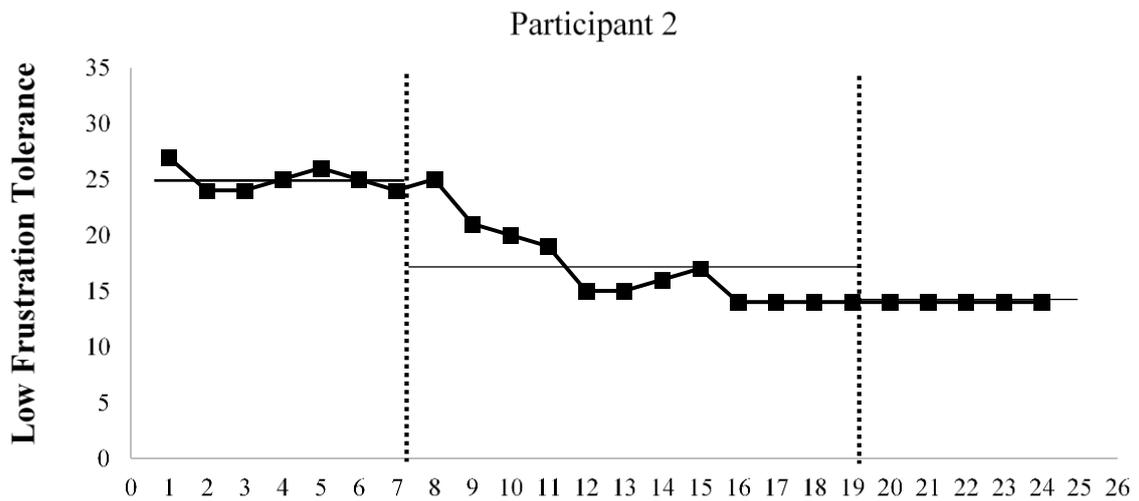
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854 Figure 1. Graphed data for low frustration tolerance across timepoints for each participant.

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891 Figure 2. Graphed data for unconditional self-acceptance (USA) across timepoints for each  
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