



Perfectionism Patterns, Dark Personality, and Exercise Addiction Trend in High-Intensity Sports

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Abstract

The present work tries to describe the relationships among perfectionism, dark traits of personality, and exercise addiction and according to highly intense sports. Following research on perfectionism in sport, its dysfunctional facet is based on a continuous and negative cognitive-evaluative judgement about the difficulties to achieve the accomplishment of tasks or behaviors that improve their sport performance, describing how athletes configure altered thoughts or cognitive resources in their sport experiences. The Spanish versions of the Multidimensional Perfectionism Scale, the Short Dark Triad Scale, and the Exercise Addiction Inventory were applied in a sample of 462 Spanish amateur athletes (39.6% women and 60.4% men). The findings show that a more maladaptive perfectionist pattern (concern over mistakes and external criticism) is related to higher levels of dark personality traits and a greater risk of exercise addiction. However, there are no differences between runners and CrossFit users on the subject of perfectionism, dark traits, and exercise addiction scores.

Keywords Narcissism · Perfectionism · Emotional coldness · Machiavellianism · CrossFit · Running

Although professional athletes require a conscientious and full dedication to reach their purposes, such dedication is planned in a very detailed and controlled way (it is one of the great advances in the sports sciences); amateur athletes have passed from practicing their

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sports in their leisure time to much more intense activity, with more time of dedication that resembles the professional dedication.

Frequently, CrossFit and running have been recommended to amateur athletes by physical activity experts. Different potentialities have been described in the work of improving cardiac activity in both CrossFit and running (both types are known to have similar healthy effects helping to increase the heart and burn calories). On the other hand, both sports disciplines have been shown to be the most linked to exercise addiction processes in recent literature (Di Lodovico, 2019; González-Hernández et al., 2019; Lichtenstein et al., 2017; Yildiz, et al., 2017).

Both in sport context as the general population, perfectionism has been mainly considered a negative or maladaptive personality trait, a transdiagnostic process associated with the perception of anxiety (Flett et al. 2016), fair to failure (Correia, 2018; Hill et al., 2018), and negative emotional response (Stoeber & Corr, 2015). As a sensitivity response of psychosocial context around, perfectionism emerges like a risk factor or process that may be in the etiology and maintenance of other psychological disorders (Egan et al., 2011). Nevertheless, nowadays evidence suggests that perfectionism also provides positive, functional, or adaptive aspects (Flett & Hewitt, 2020; Hill et al., 2020).

In this constant person-sport interaction, an ineffective reactivity and configuration to promote the real and deep satisfaction of human needs stimulate and reward, in general, the “efforts of neurotic compensation” (Demirci & Çepikkurt, 2018). For that, perfectionism could be considered one of those individual characteristics closely related to seeking, establishing, and perceiving standards of achievement, with cognitive processes that reflect internal efforts when performance is not at the expected level (e.g., rumination), and through which the probability of experiencing an affective or emotional (mainly dysfunctional) response increases (Flett & Hewitt, 2020).

Feeding the ego and competitiveness are two of the most common psychological responses when doing sport (González-Hernández et al., 2020). Common to other addiction processes, the feelings of gratification, the activation provided by a body’s physiology when playing a sport, trigger our impulses, hedonic satisfaction, and our most unbalance responses (Hill et al., 2020; Vaughan & Edwards, 2020). While pursuing and achieving attractive goals may appear to be a short-term rewarding influence, without coherence or good psychosocial support in the long term it linked with dysfunctional both cognitive, emotional, and behavioral responses as exercise addiction (González-Hernández et al., 2020; Hill et al. 2015b).

When a person dedicates so much time and intensity to a hobby with which he or she enjoys a lot and brings satisfaction, the influence of certain internal traits such as perfectionism or narcissism can turn what was a priori gratifying into agony with a hypothetical sequence similar to (a) “I like this, I enjoy it a lot”; (b) “I have a hobby where I spend my time and disconnect”; (c) “I must/want to make it perfect so that the gratification is repeated”; (d) “I need/want more and more”; and (e) “it becomes an obligation/need.” This could be one of the sequences leading to the phenomenon of exercise addiction or dependence (González-Cutre & Sicilia, 2012), although this sequence does not inevitably lead to an addictive process. Terry et al. (2004), with the Exercise Addiction Inventory (EAI), classified it like in three levels, according to its severity: asymptomatic (have no symptoms), symptomatic (have some symptoms), and risk of exercise addiction.

González-Cutre Sicilia (2012) defined a profile of the exercise addict. This athlete could consider a person between 16 and 25 years of age, who performs free activities in gyms, in high intensity, with or without a monitor, and preferably strengthening their muscles if they

are men or performing cardiovascular exercise activities (e.g., CrossFit, spinning) if they are women.

Another characteristic sport context (mainly for men), but similar addiction responses, is endurance, sports in which they participate in popular races (e.g., marathon) or triathletes (e.g., ironman). Around these disciplines, associations with traits related to the risk of exercise addiction have been subjected to important investigations (Bircher et al., 2017) as perfectionism (Hill et al. 2015a), perseverance (González-Cutre & Sicilia, 2012), extroversion (Gucciardi et al., 2012), narcissism (Nogueira-López et al., 2019), or neuroticism (Lichtenstein et al., 2014) have shown their influence. Even features traditionally linked positively with sports practice (e.g., motivation, passion, or engagement) are being linked positively with the risk of exercise addiction (Kovacsik et al., 2020; Kurimay et al., 2013).

Increasingly, it is possible to find studies that have associated separate characteristics of the dimensions of the Dark Triad of Personality (DTP; narcissism, Machiavellianism, and psychopathy; Paulhus & Williams, 2002) (see Fig. 1) and different variables related to functional (e.g., competitiveness) and dysfunctional (e.g., addiction) psychological response (Paulhus, 2014; Persson et al., 2017). In a systematic review, González et al. (2018) described that some of these studies relate narcissism and Machiavellianism to cheating attitudes in athletes or to the devaluation of effort in athletes (Jones et al., 2017); narcissism mainly with perfectionism (Miller & Mesagno, 2014; Stoeber, 2018), persistence (Manley et al., 2018), or motivation (Roberts et al., 2015); Machiavellianism with prosocial behavior and aggressiveness (Baar & Wubbels, 2011), performance-focused cruelty and skepticism (Mirzaaghazadeh et al., 2016), or locus of control (Rankisam, 2016); and psychopathy with an inadequate emotional response in athletes (Matosic et al., 2016), even exercise addiction (Griffiths 2013).

In other study contexts, all exercise addiction characteristics described by Griffiths (2005) in his biopsychosocial framework for exercise addiction (Fig. 2) have been

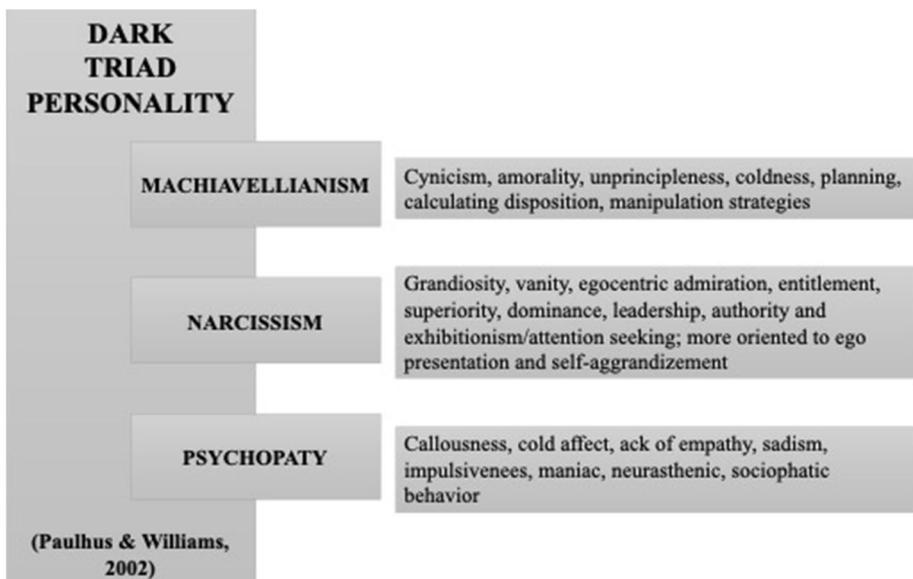


Fig. 1 Dark Triad of personality description



Fig. 2 Contexts where addiction features (Griffiths 2005) and dark traits have been associated

shared with dark traits in relationship with other issues around both positive and negative psychosocial phenomena. How will be the relationships in athletes?.

Taking into account the literature reviewed, a transversal and descriptive study with a non-randomized and correlational design was proposed, with the aim of pointing out the existing differences in perfectionist patterns and dark personality traits according to the risk of exercise addiction in a sample of Spaniard's athletes. Initial hypotheses proposed that athletes (crossfitters and runners) with a maladaptive perfectionist profile (high concern over mistakes and external criticism) would show positive relationships with dark personality traits and risk of exercise addiction, while those athletes with an adaptive perfectionist profile (high personal standards and organization) should show lower risk of addiction and influence of dark personality traits. Furthermore, in the absence of previous comparisons between sporting disciplines, and on the understanding that running and CrossFit have been understood as two sports with high addictive tendencies, the assumption is made that there will be no significant differences between running ("runners") and CrossFit ("crossfitters").

Methodology

Sample and Procedure

A non-randomized sample was composed of 426 amateurs athletes (39.6% women and 60.4% men), with a range age between 22 and 45 years old ($M = 36.43$; $SD = 6.47$). 52.7% were crossfitters and 47.3% were runners, with an average weekly training session of 19.26 h/week ($SD = 4.32$). The way of proceeding in the data collection followed the same protocol of action in each one of the sports environments during 2019 and 2020. Prioritizing group administration and without exclusion criteria, a member of the research group present followed the following administration protocol: (a) explanation of the purposes of the study in their training places and, to protect subject anonymity, (b) participants identified their consent, confidentiality, and anonymity according to the American Psychological Association's ethical guidelines, following the tenets of the Declaration of Helsinki (2017) and also the indications of the Project identification code: Research Ethics Committee IEC/85/15/75 of 21 June 2019.

Measures

A Spanish version (Carrasco et al., 2010) of the Multidimensional Perfectionism Scale (FMPS, Frost et al., 1990) was used. This scale is formed by 35 items and consists of four dimensions of the first order (personal standards, organization, concern over mistakes, and external criticism). The response options for each of the items cover a range of 5 points on a Likert scale, with 1 meaning “in total disagreement” and 5 meaning “completely agree.” Global reliability indicated a Cronbach’s alpha of 0.85 (dimension reliability data are shown in Table 1).

The Short Dark Triad Scale (SD3), adapted to the Spanish population for Pineda et al. (2018), was administrated (Jones & Paulhus, 2014). It is a 27-item questionnaire that measures Machiavellianism (e.g., “It’s not wise to tell your secrets”), narcissism (e.g., “People see me as a natural leader”), and psychopathy (e.g., “Payback needs to be quick and nasty”). All questions were answered on a 5-point Likert-type scale, which was anchored at 1 = “not at all” and 5 = “extremely.” The general reliability of the scale showed an important consistency of Cronbach’s alpha of 0.92.

The Spanish version of the Exercise Addiction Inventory (EAI) (Sicilia-Camacho et al., 2013) was applied (Terry et al., 2004). This instrument around 6 items uses a Likert scale ranging from 1 (completely disagree) to 5 (completely agree), where it allows describing three dimensions (asymptomatic (i.e., scores between 0 and 12), symptomatic (i.e., scores between 13 and 23), and at risk of EA (i.e., scores of 24 or more)) and a second-order dimension (exercise addiction), which Cronbach’s alpha was 0.82.

Statistical Analysis

With the purpose of showing general samples characteristics defined, sociodemographic data (central tendency, frequency measures) was analyzed. Sample normality tests were checked through Kolmogorov–Smirnov, assuming the suitability of the parametric tests. Confirmatory factor analyses (CFA; using AMOS 23.0), parameter estimation by maximum likelihood (> 5000), and Cronbach’s alpha are performed to consider the internal reliability of the instruments. The model goodness-of-fit was evaluated using the χ^2/df ratio (< 0.5) (Hu & Bentler, 1999), the root mean square error of approximation (RMSEA) with its 90% confidence interval, the comparative fit index (CFI), and the Tucker-Lewis index (TLI). Values of less than 0.06 indicate a good fit of the model for the RMSEA (Marsh

Table 1 Differential and linear relations, controlling by sport disciplines

N = 426	CrossFitters										Runners											
	Range	K-S	M(SD)	1	2	3	4	5	6	7	8	9	M(SD)	1	2	3	4	5	6	7	8	9
1. Age	22-45	.24	34.57(9.84)	-									38.43(7.26)	-	-.64**	-.57**	-.72**	.53*	-.38*	-.52	-.61	.39*
2. PS	0-5	.35	3.51(.78)	-.72**	.68 ^W								3.18(.83)	.80 ^W	.37**	.41*	.26	.68**	.72*	.64**	.73**	
3. EC	0-5	.29	3.05(1.03)	-.49*	.74**	.68 ^W							2.86(.92)	.62 ^W	.31*	.34	.61**	.52*	.48	.62**		
4. CM	0-5	.32	3.55(.81)	-.56**	.71**	.73**	.67 ^W						3.55(.81)	.76 ^W	.23	.70*	.59**	.50*	.74**			
5. O	0-5	.17	3.69(.68)	.40*	.65*	.71**	.52**	.68 ^W					3.69(.68)	.63 ^W	.48*	.47*	.63	.54*				
6. N	0-5	.28	3.59(.63)	-.58*	.57**	.62*	.59*	.54*	.67 ^W				3.59(.63)	.60 ^W	.85**	.79**	.73**					
7. M	0-5	.26	3.28(.79)	-.62	.49*	.53*	.39*	.60*	.87**	.67 ^W			3.28(.79)	.75 ^W	.87**	.54**						
8. P	0-5	.32	3.05(.94)	-.43	.51*	.42	.61*	.48	.84**	.93**	.67 ^W		3.05(.94)	.73 ^W	.48*							
9. EA	6-30	.27	21.47(1.26)	-.47**	.68*	.51**	.71**	.44*	.78*	.49*	.47*	.63 ^W	19.03(1.73)	.83 ^W								

* $p < .05$; ** $p < .01$. $\sqrt{\text{Cronbach's alpha}}$

PS, personal standards; EC, external criticism; CM, concerns over mistakes; O, organization; N, narcissism; M, Machiavellianism; P, psychopathy; EA, exercise addiction

et al. 2004), while values higher than 95% indicate an excellent fit of the model for CFI and TLI.

To describe the differences between subsamples (runners vs crossfitters), differential multivariate analysis (MANOVA) was performed for both sport modality and risk addiction levels (Pillai's Trace; 95% CI). Finally, Pearson's correlation analyses (partials controlling by sport discipline) to determine the degree of linear relationship between the variables under study were taken into account. The statistical program used for the above-mentioned analyses is SPSS (IBM), version 23.

Results

Initially, confirmatory factorial analysis (CFA) showed a goodness in fit scores for measures of perfectionism ($\chi^2/df=7.03$, $p<0.01$; CFI=0.093; TLI=0.90; RMSEA=0.07 (90% CI=0.05–0.16)), dark traits ($\chi^2/df=5.47$, $p<0.01$; CFI=0.092; TLI=0.94; RMSEA=0.07 (90% CI=0.04–0.15)), and exercise addiction ($\chi^2/df=6.24$, $p<0.01$; CFI=0.091; TLI=0.93; RMSEA=0.07 (90% CI=0.03–0.14)).

Hoping to establish linear associations between perfectionism, dark features, and exercise addiction, a correlative analysis was carried out differentiating by sport disciplines (Table 1), showing similar associations profiles. Both in running and CrossFit, athletes highlighted how narcissism, Machiavellianism, and exercise addiction maintained positive and significant links with both adaptive perfectionism dimensions (personal standards and organization) (crossfitters (0.001–0.02); runners (0.001–0.03)) and maladaptive perfectionism dimensions (concern for mistakes and external criticism) (crossfitters (0.001–0.03); runners (0.001–0.01)). Also, in both sport disciplines, psychopathy showed significant and positive links with exercise addiction (crossfitters (0.03); runners (0.001)), concern over mistakes (crossfitters (0.001); runners (0.001)), and personal standards (crossfitters (0.001); runners (0.03)).

Figure 3 shows the variance multivariate analysis (MANOVA) searching to identify the existence of statistically significant differences in dark personality traits and perfectionism, according to sports disciplines and exercise addiction level of athletes. Variables were adjusted to the normality assumption, and significant differences between sport disciplines (<0.05) were observed (Table 1). With a 23.4% of explained variance and a moderate

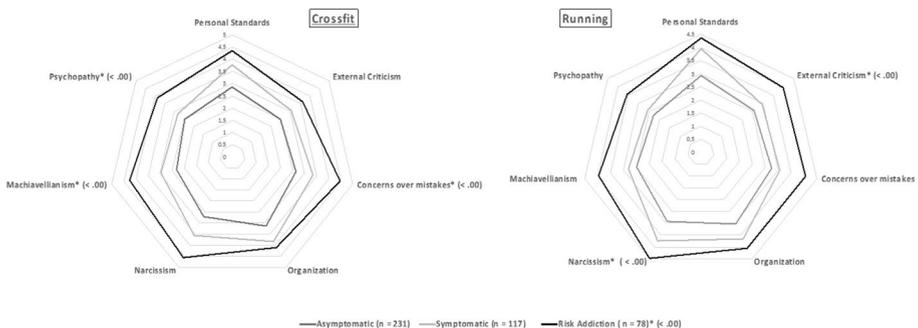


Fig. 3 Multivariate analysis (MANOVA), according to risk of exercise addiction and sport modalities

effect size ($F_{(3,423)} = 31.32$; $p < 0.001$; $\eta^2 = 0.46$), significant differences between levels of exercise addiction only showed an increased risk of exercise addiction in favor of runners.

Specifically, in relation to disciplines, personal standards ($t_{(2,424)} = 7.63$; $p < 0.01$), concern over mistakes ($t_{(2,424)} = 4.95$; $p < 0.03$), Machiavellianism ($t_{(2,424)} = 6.34$; $p < 0.001$), and psychopathy ($t_{(2,424)} = 5.27$; $p < 0.001$) were in favor to crossfitters, while narcissism ($t_{(2,424)} = 8.01$; $p < 0.001$) and external criticism ($t_{(2,424)} = 8.03$; $p < 0.02$) were in favor to runners.

In relation to exercise addiction levels, personal standards ($t_{(2,424)} = 7.09$; $p < 0.01$) and narcissism ($t_{(2,424)} = 5.46$; $p < 0.001$) showed significant differences in favor to high risk exercise addiction; Machiavellianism ($t_{(2,424)} = 5.18$; $p < 0.001$), concern over mistakes ($t_{(2,424)} = 4.32$; $p < 0.01$), and psychopathy ($t_{(2,424)} = 6.91$; $p < 0.001$) in favor to symptomatic exercise addiction. In relation to discipline * exercise addiction level, CrossFit discipline showed significant differences over running with respect to risk of exercise addiction.

Discussion

The present study was to describe how is the functioning of perfectionistic patterns in relation to dark trait core (narcissism, Machiavellianism, and psychopathy) and risk addiction exercise, showing their differences in two high sport intensity disciplines by amateur athletes. The main focus of the dark triad is the subclinical manifestations of peculiar characteristics around negative behaviors. For this reason, knowing possible links with perfectionism patterns can explain the appearance (how and when) of exercise addiction symptomatology.

More and more, amateur athletes have increased the intensity and specialization of their practice, seeking quasi-professional training goals and methods. Many of them, follow an addictive pattern both by the sport disciplines (e.g., high intensity or endurance) as in cognitive and emotional processes in a constant demand to improve performance (e.g., impulsiveness, distress, ruminations; McNamara & McCabe, 2012).

The first hypothesis indicated that maladaptive perfectionist patterns should show positive and significant links with dark personality traits and risk of exercise addiction, while adaptive perfectionist patterns would have them with low dark traits and risk of exercise addiction scores. However, the results showed partial compliance. Both adaptive and maladaptive perfectionist patterns showed positive relationships with exercise addiction. In the same way, narcissism and Machiavellianism pointed out positive links both adaptive and maladaptive perfectionist patterns. Psychopathy did not show relationships with external critics or organization, while it did show positive and significant relationships with others. According relevant studies on exercise addiction (Griffiths, 2013) and perfectionism (Gonzalez-Hernandez et al., 2021), in cross-sectional studies (both sport and any other context) unpredictable outcomes are one of the most classic controversies in the scientific literature on perfectionism, showing both positive and negative links with other psychological variables. In studies, longitudinal designs have pointed out more evidence about the negative consequences of perfectionism on individual maladjustment (e.g., risk of exercise addiction) (Hill et al., 2020; Stoeber et al., 2021) and have offered more light on the relevance and wear and tear of the passage of time (Flett & Hewitt, 2014) or of psychological efforts to maintain internal control (Hill et al., 2020; Lichtenstein et al., 2017).

Following the second hypothesis, perfectionism (concern over a mistake) and dark traits (Machiavellianism and psychopathy) showed significant differences in favor of risk addiction in CrossFit athletes, while external criticism and narcissism in running athletes were significantly highlighted. Following last studies on exercise addiction in similar samples, maladaptive perfectionism, low empathy, and narcissistic personality were mainly developed to achieve personal or social self-gratification (Bebetsos et al., 2017; Nogueira et al., 2019; Lichtenstein & Hinze, 2020).

Included in this line, although CrossFit discipline showed significant differences over running with respect to risk of exercise addiction, similar fits (even with runners) with previous studies focused on describing the phenomenon of sport addiction (Bircher et al., 2017; Lichtenstein et al., 2014) can be described. Punishment, lack of rewards, or perceived pressure (in the form of criticism) from coaches, parents, or peers generate significant internal efforts to counteract and fight them (even if it is only interpreted by the athletes and is not true) (Bebetsos et al., 2017; Sellars et al., 2016).

This altered interpretation (e.g., cognitive biases) in athletes is translated into a dysfunctional mental response that can lead to overtraining (Hackfort & Kleinert, 2007), fear (Ridinger et al., 2012), injuries, and negative mood states (Gallardo-Fuentes, 2019; Rex & Metzler, 2016) or experiential avoidance (Lochbaum & Gottardy, 2015) along with the sports practice (Stone, et al., 2012). All of them are features associated with exercise addiction (Lichtenstein et al., 2018) and narcissism (Currie-McGhee, 2011; Symons Downs et al. 2019).

There are limitations that must be pointed out in the present research. First, the use of a cross-sectional study offers a specific and situational interpretation of results. For this reason, it suggests a focus limited by understanding the multidimensional of perfectionism and links with other negative traits or exercise addiction by long term. Accordingly, conclusions only regarding causality can be made, mainly from theoretical deduction and bearing trends of the last researches around topics of this study. Second, although the sample is considerable and displayed a large variation with regard to age and inside both sport disciplines, only two sports are circumscribed (CrossFit and running); therefore, whether the results may be generalized to other sport disciplines can have some uncertainty. Third, although the present study has been made under the exercise addiction model (Griffiths 2005), other more qualitative data could be explained with other definitions under the same model (e.g., asymptomatic; symptomatic; risk addiction) as recent research propose (Szabo et al., 2019). In that study, general factor of exercise addiction was chosen, due to the great number of variables brought into play.

Conclusions

Increasingly, the study of personality in sport is occupying relevant importance in the quality of scientific explanations, contemplated within a multifactorial and complex context. Both for leisure, health, and performance-oriented, the mediating force of personality emerges in studies connecting cognitive and emotional skills with addictive behaviors in sport (e.g., perception of external criticism has been found to be an important predictor for identifying negative processing, as current studies have shown) (Curran et al., 2017; Manley et al., 2018).

In the face of the extensive research on trait perfectionism's relationship with a misadjusted psychological response, there is little research on perfectionistic self-presentation

and perfectionistic cognitions' relationships with dark trait personality. Many studies have been focused on describing vulnerability as high narcissistic or low empathic component, making it work on perfectionism and psychological vulnerability in sport as an important future direction. Besides, the importance of multi-wave and multilevel longitudinal data is needed to test the directions of those associations, and their correspondence with functional (e.g., confidence or highly achieving) and dysfunctional (e.g., addiction or aggressiveness) behavioral and psychological responses (Smith et al., 2016).

Hence, this empirical proposal wants to mark a path of useful studies where an explanatory framework can be established that allows for representative figures around the athlete (e.g., coaches, doctors, and sports psychologists), to identify sufficiently in advance from the same sports context, risk factors, prevention, and promotion of psychological maladjustment in the athlete as occurring in the processes of addiction.

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Declarations

Conflict of Interest The authors declare no competing interests.

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