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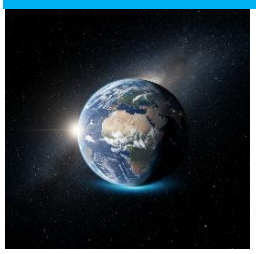

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Cumulative Psychopathology and the Return-to-Sport Gap in Non-Elite Athletes: A Narrative Review of Injury vs. Forced Detraining

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Abstract

Background: Regular physical activity acts as a physiological buffer for non-elite athletes, mediating emotional regulation. However, training continuity is frequently disrupted by individual traumatic musculoskeletal injuries or forced detraining (e.g., lockdowns). The differential mental health impact of these breaks in non-elite populations remains underexplored.

Aim: This narrative review aims to analyse the differential psychological impact of injury-induced versus forced detraining, and evaluate additional factors associated with training cessation in recreational athletes.

Material and methods: A comprehensive literature search was conducted using PubMed, Scopus, and Google Scholar databases for studies published between 1993 and early 2026. The review focuses on recreational athletes defined as individuals training regularly (>4 hours/week) without professional income.

Results: The reviewed literature reveals a consistent "return-to-sport gap" following injuries, where psychological barriers - primarily kinesiophobia and identity foreclosure - significantly hinder competitive return despite full physical recovery. In contrast, forced detraining events trigger collective acute crises characterized by widespread depressive symptoms, severe lifestyle and routine disruptions, and loss of motivation across the athletic population. Across both contexts, sidelined athletes exhibit high vulnerability to maladaptive coping, though targeted social support emerges as a universal mediator facilitating Post-Traumatic Growth.

Conclusions: The mental health impact of training cessation is mediated by the etiology of the break and the athlete's cognitive appraisal. Clinicians must address not only the physical rehabilitation but also the potential for eating disorders, substance use, and identity crisis in sidelined amateurs.

Keywords: non-elite athletes; mental health; injury-induced psychopathology; return-to-sport gap; forced detraining; athletic identity; post-traumatic growth; exercise withdrawal.

Introduction

The Psychological Architecture of the Recreational Athlete

In today's world, recreational sport has grown into something much bigger than leisure. For millions, it is a fundamental survival strategy. It helps manage the chaos of modern life, from burnout at work to pressures at home. For the amateur, the daily grind of training provides a "psychological buffer," offering a sense of control and measurable progress that is often missing in other parts of life [1].

Physiologically, regular training changes the brain just as much as the body. The "habitual exerciser" relies on a steady dose of dopamine, serotonin, and endocannabinoids to keep their mood stable. Consequently, the cessation of training - whether voluntary or forced - represents not just a pause in physical activity, but a critical removal of the individual's primary psychological scaffolding [2]. The mental health trajectory of the sidelined athlete has been extensively studied within elite pros, where the stakes involve financial livelihood and public career status. However, recreational athletes operate in a distinctly different ecosystem.

> Unlike professionals, who are supported by integrated medical teams, sports psychologists, physiotherapists, statisticians and clear return-to-play protocols [3], amateurs, by contrast, usually face the collapse of their routine alone. This isolation is compounded by a lack of institutional support; there is no off-season conditioning coach to manage their load, nor a team psychologist to reframe their cognitive distortions [4]. The recreational athlete is, in many ways, an "invisible patient" when injury strikes - their suffering is privatized, occurring in the quiet of a home rather than the public arena of a stadium, sports and social media journalists.

The Methodological Gap: Extrapolation vs. Reality

A major issue with current science is that it often takes findings from elite athletes and just assumes they apply to amateurs. This extrapolation fails to account for unique stressors faced by amateurs, such as "financial strain" (the lack of income protection during injury rehabilitation) and the social trivialization of their athletic grief. Friends, family members, and even medical practitioners often dismiss the amateur's distress which can make the isolation worse.

This review seeks to fix that gap by distinguishing between two primary contexts of cessation:

Traumatic/Injury-Induced: Characterized by sudden onset, acute physical pain, navigating the medical system, and individual isolation. Pain and loneliness.

Forced detraining/Structural: Encompassing planned off-seasons, post-competition transitions, and forced detraining events like the COVID-19 pandemic.

While injury inherently results in forced detraining, for the purpose of this review, we distinguish between traumatic, individual-specific cessation (injury) and non-traumatic, collective detraining (forced detraining due to external/systemic factors).

Using the Self-Determination Theory (SDT) [5] and the Biopsychosocial Model [6] as theoretical frameworks, we synthesize current evidence on the mental health outcomes of these interruptions to inform better clinical and coaching practices.

Methods

Search Strategy

A comprehensive narrative search was conducted using PubMed, Google Scholar, and Scopus databases. The search strategy utilized Boolean logic with the following keyword strings: ("recreational athlete" OR "amateur athlete" OR "non-elite athlete") AND ("training cessation" OR "injury" OR "forced detraining" OR "lockdown" OR "COVID-19") AND ("mental health" OR "depression" OR "anxiety" OR "athletic identity" OR "return-to-sport gap").

The search was limited to publications in English. The timeframe spanned from 1993 to January 2026, with a special focus on the last decade to capture the most recent data emerging from the pandemic era.

Inclusion Criteria: Defining the Recreational Athlete

Defining the "recreational athlete" is problematic. To avoid the ambiguity often found in sports literature, "recreational athletes" were defined strictly according to the classification by McKinney et al. [7]. We define "recreational athletes" as individuals exercising regularly (minimum 4 hours/week) with specific performance goals (e.g., marathons, triathlons, competitive amateur leagues, games), but without deriving primary income from sport.

This distinction is crucial. It excludes the "casual exerciser" (who may exercise for general wellness without performance metrics) and the "elite athlete" (whose livelihood depends on performance). The "competitive recreational athlete" represents a specific phenotype: high emotional investment, high training volume, but low institutional support. This population

is particularly vulnerable to "identity foreclosure" because their athletic role is often a cherished escape from their professional identity, and its loss is felt acutely as a loss of self [8].

3. Theoretical Frameworks: Identity and Withdrawal

3.1 The Neurobiology of Withdrawal: The "Iceberg" Inversion

No matter the cause, stopping a habit triggers a physiological state known as "exercise withdrawal". Regular aerobic exercise is known to upregulate the secretion of neurotransmitters such as dopamine and serotonin, which act as a neuroprotective buffer against depression [2]. Furthermore, exercise stimulates the release of Brain-Derived Neurotrophic Factor (BDNF), a key mediator of neuroplasticity and neuronal survival. Recent research by Romero Garavito et al. [9] underscores the critical importance of this protein, noting its profound impact not only on cognitive function and emotional regulation but also on systemic physiological health. Elevated BDNF levels are associated with improved cardiovascular fitness and metabolic regulation, effectively serving as a biological bridge between somatic exertion and mental resilience. Consequently, the sustained presence of BDNF is vital for maintaining the structural integrity of neural networks involved in mood stability. It helps preserve cognitive integrity by counteracting oxidative stress and inflammatory pathways, linking physical fitness directly to mental well-being [9].

When training stops, the rapid withdrawal of these neurochemical stimuli can precipitate symptoms resembling clinical substance withdrawal, including irritability, insomnia, anxiety, and profound mood disturbances. This phenomenon is often described in literature as the inversion of Morgan's "Iceberg Profile" [10]. The "Iceberg Profile" characterizes the successful athlete as having high levels of Vigor and low levels of Tension, Depression, Anger, Fatigue, and Confusion. During cessation, this profile shifts: Vigor plummets, while Tension and Depression spike, creating a flat or inverted emotional profile [10].

Szabo [11] highlights that for habituated exercisers, this deprivation leads to a measurable decline in well-being within as little as 24 to 48 hours. This suggests that the psychological benefits of exercise are not stored; they are transient and require constant "dosing." Mondin et al. [12] demonstrated that even short-term deprivation (3 days) in habitual runners resulted in significant increases in somatic anxiety and distress, comparable to withdrawal

symptoms seen in pharmacological dependencies. This dependence is often quantified using the Exercise Dependence Scale, which highlights the risk of pathological attachment to training [13].

3.2 Athletic Identity and Foreclosure

A critical moderator of distress during cessation is Athletic Identity - defined as the degree to which an individual identifies with the athlete role. While high Athletic Identity is beneficial for training adherence, performance, and discipline, it becomes a severe liability during cessation. This vulnerability is best explained by the concept of "Identity Foreclosure" [8].

> Identity Foreclosure occurs when an amateur athlete rigidly defines their self-worth solely through sport (e.g., "I am a runner" rather than "I am a person who runs"). When injury or life circumstances remove the ability to perform, the individual suffers a "loss of self." Brewer [8] demonstrated that individuals with exclusive athletic identities experience significantly higher rates of depression and lower global self-esteem post-injury compared to those with multidimensional self-concepts. Vallerand [1] further linked this rigidity to "Obsessive Passion", where the activity controls the athlete, leading to maladaptive outcomes during forced breaks.

3.3 Self-Determination Theory (SDT)

To understand the psychological mechanism of distress, we apply the Self-Determination Theory (SDT), which posits that human well-being depends on the satisfaction of three basic psychological needs: Autonomy, Competence, and Relatedness [5]. Training breaks aggressively thwart these needs:

Autonomy: Autonomy: This is lost due to medical restrictions (in injury) or government mandates (in lockdowns). The athlete loses agency over their body and schedule. The locus of control shifts from internal (I decide to run) to external (The doctor or government says I cannot run). Self-determined motivation is a key predictor of recovery adherence, suggesting that the loss of autonomy directly hampers rehabilitation [14].

Competence: This is undermined by the rapid loss of physical fitness and the inability to perform previously mastered skills. The athlete witnesses the detraining process - loss of

muscle tone, reduced cardiovascular capacity - which directly attacks their sense of efficacy [15].

Relatedness: This fundamental psychological need is severely compromised by sudden isolation from the training community [5]. For many amateur athletes, the training group serves as their primary social circle; therefore, training cessation and the subsequent loss of peer support equate to a profound sense of "social death" [6, 15].

4. Comparative Analysis: Injury vs. Forced Detraining

4.1 The Psychology of Injury: Trauma and Isolation

Injury represents a traumatic, individual crisis. The Biopsychosocial Model suggests that how an athlete thinks about the injury matters more than the tissue damage itself [6].

The biggest enemy here is Kinesiophobia (Fear of Movement). Explained by the Fear-Avoidance Model of Pain, catastrophic thinking about pain leads to avoidance behaviors. The injured amateur develops a belief that movement will cause re-injury, creating a vicious cycle of disuse, physical deconditioning, and deepening depression [16]. Unlike the pro athlete, who is guided by physiotherapists daily, the amateur often lacks the expertise to differentiate between non-threatening discomfort and tissue-damaging pain, leading to excessive caution and delayed rehabilitation. Consequently, fear of reinjury becomes a primary psychological barrier to returning to sport, often persisting long after physical healing [17].

> It is also impossible to ignore economic reality. In many countries the public healthcare system involves long waiting times for rehabilitation. The amateur athlete faces a brutal choice: wait months for free treatment while their mental health deteriorates, or pay out of pocket for private care. Combined with the general psychological stressors of injury - such as the anxiety and fear of reinjury noted by Putukian [18] - this financial burden significantly delays recovery.

4.2 Forced Detraining: Systemic Breaks and Pandemic

Systemic breaks are different. Everyone stops together. The COVID-19 lockdowns served as a global "natural experiment" in forced detraining. Studies indicated that while the "Fear of Missing Out" (FOMO) was mitigated because the cessation was collective (everyone was

stopped), amateurs still reported alarming levels of anxiety due to the loss of structure and uncertainty. Maugeri et al. [19] found that the reduction in physical activity during the pandemic was significantly associated with poorer psychological health in the general population and athletes alike.

The sheer scale of this psychological distress was robustly quantified during the COVID-19 lockdowns. Survey data collected by Pillay et al. [21] demonstrated that sudden forced detraining led to profound lifestyle and mood alterations. Observing mental states, 52% of the sidelined athletes reported feeling depressed at some time, with females reporting a significantly higher rate of depressive symptoms than males ($p < 0.0001$). Furthermore, 55% of respondents struggled to keep motivated, and significant sex differences were noted, as female athletes reported higher energy loss ($p = 0.0084$) and lack of motivation ($p = 0.0358$) compared to males. The cessation also significantly altered daily routines: athletes reported major changes in sleep-wake times
($p < 0.0001$), and females felt significantly more fatigued than their male counterparts ($p = 0.0213$). Nutritional patterns were also disrupted, marked by excessive carbohydrate consumption
($p < 0.0001$). These robust statistics prove that systemic breaks are not merely periods of "rest," but acute psychophysical crises that require active, and potentially gender-specific, clinical management.

4.3 The "Post-Competition" Void

A sub-category of systemic breaks often overlooked in amateur populations is "Post-Competition Depression" (equivalent to the "Post-Olympic Blues" seen in elites) [20]. Occurring after major goals (e.g., completing a first marathon or Ironman), this depressive state stems from the loss of a long-term goal. The sudden void in daily structure and the loss of a singular focus can lead to a profound sense of emptiness, challenging the notion that voluntary breaks are always psychologically benign.

4.4 Comparative Summary

Injury-induced cessation differs from systemic or planned breaks primarily in the locus of control and the initial trigger, which for injuries is typically a sudden, external, and highly individualized trauma. Furthermore, injuries are inherently accompanied by physical pain and the fear of reinjury (kinesiophobia), whereas forced detraining is predominantly

characterized by anxiety over detraining and potential weight gain. The forced social isolation and thwarted needs for autonomy and competence in injured athletes generate grief, anger, and fear, contrasting with the restlessness, apathy, and sense of void associated with the shared experience of structural breaks. Ultimately, the perspective of returning to sport following an injury is highly uncertain and heavily dependent on rehabilitation progress, while returning from forced detraining relies primarily on organizational policies and scheduled timelines [4, 6, 18].

4.5 The Digital Platforms:

We cannot talk about modern athletes without mentioning digital platforms. In the context of injury, digital platforms can become psychological stressors. The sidelined athlete, bombarded by peers' performance milestones, experiences a maladaptive form of Social Comparison, manifesting as a sense of 'athletic alienation.' Conversely, during systemic disruptions like COVID-19, these tools functioned as a digital lifeline. Virtual engagement sustained social cohesion when physical proximity was restricted [21]. Ultimately, digital technology acts as a situational amplifier: it exacerbates the isolation of the injured, yet bridges the gap for a community in crisis.

5. Clinical Outcomes and Risks

5.1 Eating Disorders and Body Image

For many recreational athletes, high-volume training acts as a primary weight-control mechanism and a license to eat. Cessation removes this regulatory tool, triggering intense anxiety regarding body composition. Putukian [18] warns of an increased risk of Disordered Eating during breaks.

> Athletes may engage in severe caloric restriction to "compensate" for the lack of expenditure, or conversely, engage in binge eating due to stress. This is particularly prevalent in weight-sensitive sports (e.g., running, cycling) where the fear of weight gain is conflated with the fear of performance loss. The concept of "Anorexia Athletica" becomes relevant here, where the exercise was the purging mechanism; without it, the pathological relationship with food is laid bare [13].

5.2 Substance Use as Maladaptive Coping

Denied the natural endorphin release of sport, some amateurs turn to external substances to regulate mood. Data from the pandemic period indicates increased alcohol consumption among sidelined athletes [21]. This behavior often serves as a maladaptive coping strategy to manage the boredom, identity loss, and the "void" left by training sessions.

The mechanism here resembles "addiction transfer", where the athlete transfers their dependency from the endogenous opioids of exercise to the exogenous sedation of alcohol or drugs. This risk is theoretically heightened in individuals with high Athletic Identity; as Brewer [8] demonstrated, these athletes experience profound psychological pain and a "loss of self" when sidelined, making them potentially more vulnerable to using substances to numb this distress.

5.3 Aggression and Mood Disturbance

Visek et al. [22] identified a significant association between strong Athletic Identity and aggressive behaviour. When the primary physical outlet for stress regulation is obstructed, the resulting psychological tension often manifests as "displaced aggression" in domestic or professional settings, which further isolates the athlete from their social support system.

Crucially, recent research confirms that this psychological strain remains a pressing issue. A comprehensive 6-month longitudinal study by Gil-Caselles et al. [23] demonstrated that among endurance athletes (specifically triathletes), the frequency and severity of injuries are directly correlated with elevated levels of psychopathology. Their findings revealed that an increased number of injuries resulted in significantly higher levels of stress ($p < 0.01$), depression ($p < 0.05$), and the mood state of anger ($p < 0.05$). Furthermore, correlational analyses confirmed a strong positive relationship between the total number of injuries and key mental health indicators, notably depression (Rho = 0.533, $p < 0.01$) and stress (Rho = 0.531, $p < 0.01$). This suggests that the psychological toll of cessation is cumulative; repeated interruptions do not "toughen" the athlete but rather compound the risk of aggressive or depressive symptoms, highlighting the need for continuous mental health monitoring during rehabilitation.

5.4. The Resource Gap: Hidden Vulnerability

Crucially, this is where the divide between the elite and the amateur becomes most dangerous. Professional athletes operate within a surveillance system; their weight fluctuations and mood swings are often monitored by team nutritionists and psychologists who can intervene early. The recreational athlete, however, suffers in the shadows. Lacking this institutional safety net, their maladaptive behaviors - whether starving, drinking, or raging - often go unnoticed by family or colleagues until they spiral into clinical pathology [4]. For the amateur, there is no "off-season" check-up to catch these issues before they cause permanent damage.

6. Pathways to Recovery: Resilience and Post-Traumatic Growth

6.1 Resilience and the Salutogenic Model

Recent literature shifts the focus from a purely pathogenic model (what goes wrong) to a salutogenic one (what creates health), exploring the potential for growth [24]. Post-Traumatic Growth (PTG) describes the positive psychological change experienced as a result of struggling with highly challenging life circumstances.

6.2 MetaHabilitation

Moving beyond simple restoration, the MetaHabilitation model outlines six distinct stages of recovery. The process begins with acute recovery focused on survival and immediate stabilization, leading to a crucial turning point characterized by a conscious decision to move forward, often described as "saying yes to life." This is followed by an active focus on treatment through clinical and therapeutic protocols, which paves the way for a phase of acceptance and adaptation where individuals acknowledge their limitations and reflect on the changes. Ultimately, athletes undergo reintegration into their social and professional lives before reaching the final, transformative stage of MetaHabilitation, wherein the trauma is successfully integrated into a stronger identity to achieve Post-Traumatic Growth [24].

6.3 Social Support

The most significant predictor of resilience is Social Support. Rees and Hardy [25] differentiate between "Tangible Support" (financial/logistical assistance) and "Emotional Support." For the amateur, maintaining connection with the training group (e.g., attending races as a volunteer, social gatherings) can mitigate the effects of "Social Death".

6.4 Return to Sport Confidence

The critical importance of psychological readiness is underscored by striking statistical evidence. A comprehensive meta-analysis by Ardern et al. [3] revealed a significant discrepancy between physical recovery and actual sports participation. Although the vast majority of athletes (over 80%) achieve satisfactory physical function following severe interventions like ACL reconstruction, only approximately 65% manage to return to their preinjury level of sport, and merely 55% return to competitive sport. This "return-to-sport gap" highlights that psychological barriers, predominantly kinesiophobia and lack of confidence, are often more debilitating than the physical tissue damage itself.

Podlog and Eklund [26] established that physiological readiness does not equal psychological readiness. "Return to Sport Confidence" is a distinct construct involving trust in one's body and the absence of fear. Amateurs often rush this phase due to a lack of supervision, leading to re-injury which may further exacerbate the risks identified by Podlog and Eklund [26]. A graduated return, focusing on "small wins" and competence building, is essential for restoring psychological equilibrium.

7. Limitations and Future Directions

This review acknowledges several limitations. Primarily, the definition of "recreational athlete" remains heterogeneous across studies, ranging from "weekend warriors" to sub-elite competitors, which complicates the generalizability of findings [7]. Furthermore, the majority of analyzed studies rely on cross-sectional data, which precludes the establishment of strict causality between cessation and psychopathology.

Future research should prioritize longitudinal designs that track mental health baselines prior to injury or cessation events. Additionally, the role of "passion types" (Harmonious vs. Obsessive) warrants further investigation in the amateur context, as it appears to be a key differentiator in resilience [1].

8. Conclusions

The mental health of the recreational athlete is precarious during training interruptions. While physiological withdrawal provides a baseline of distress for all active individuals, the specific etiology of the break dictates the clinical picture. Injury creates a crisis of autonomy, fear, and identity foreclosure, while forced detraining attacks structure and relatedness.

Recognizing these distinctions is vital for sports medicine practitioners, physiotherapists, and coaches. The clinical approach must move beyond a purely biomedical focus (tissue healing) to a holistic model that includes screening for depression, monitoring for eating disorders, and actively fostering Post-Traumatic Growth. By validating the amateur's grief and supporting their identity transition, practitioners can turn a training interruption from a crisis into a period of psychological resilience.

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The authors declare no conflict of interest.

Declaration of Artificial Intelligence Use

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