# Too Much of a Good Thing: Could Your Patient Have Pathological Exercise?

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Many leading causes of disease and mortality in the United States are intimately tied to an unhealthy diet and sedentary lifestyle, and this is news to no one.[1] For many, life-long eating patterns and the perceived importance of exercise stem from childhood and adolescence. The habits, or lack thereof, displayed by immediate family and peer influences play an essential role in setting the lifestyle course for many youth, for better or worse. Despite the increasingly limiting time constraints that pediatric and adolescent primary care providers and psychiatrists face, it is essential to address unhealthy dietary habits and encourage regular physical activity to adequately promote child and adolescent health.

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What may come as news to some, however, is that psychiatrists and primary care physicians have a shared responsibility to encourage some young patients to reduce the quantity and intensity of their exercise. For a small but significant cohort, exercise is already an integral part of life and sense of self. While many well-adapted young people define themselves through athletic involvement and benefit from structure, discipline, and comradery as a member of a team or working toward an individual fitness goal, some push themselves too far. For many, exercise serves as a coping mechanism that may be initially adaptive. However, they can ultimately feel the need to exercise with increasing frequency, intensity, and duration, perhaps to the point of injury. When injured, they push forward with their regimen or become wracked with frustration and anxiety. If life gets between them and a scheduled workout, they can experience emotional, even physical, withdrawal symptoms. Individuals relying on physical activity as a primary coping mechanism face the additional weight of emotional issues that led them to exercise, leaving them in even greater emotional turmoil and without adequate coping skills to adapt. Exercise comes to be the most important aspect of life, taking precedence over other responsibilities and wreaking havoc on their physical and mental wellbeing. For these patients, typical messages of encouragement to lead a healthy lifestyle are actually harmful.

What is being described here is pathological exercise (PE). PE is currently not a diagnosable mental illness found in the *DSM-5*,[2] but it can be a symptom of an eating disorder (ED). PE has been described as either primary or secondary,[3] as well as either an addiction or a compulsion. Primary PE exists without an accompanying ED or body dysmorphic disorder (BDD); thus the primary motivations to exercise are the rewards of exercise itself, including stress relief, improved self-image, and alterations in neurotransmitter release responsible for "runners' high." Secondary PE exists as a symptom of another disorder, usually an ED; the desire to exercise is secondary to the desire to lose weight or attain a leaner or more svelte physique. It is widely recognized that some with an ED adopt exercise as a maladaptive compensatory behavior to burn calories, but fewer realize that exercise can be problematic in the absence of an ED. Even if physicians can conceive of exercise in itself as potentially maladaptive, it can

be difficult to recognize when embodied by a young, healthy-appearing patient.

So how many are suffering from PE unbeknownst to their physicians and therapists? There is much uncertainty regarding prevalence, with estimates among adults ranging from 1.4% to 52%, depending upon the assessment technique and participant sample.[4-6] Many studies have targeted cross-country runners and other endurance athletes—populations where the proportion with PE would be much higher than the general population. To clarify, it is not the duration or intensity of the exercise itself that characterizes PE, but the mindset with which one exercises, the implosion of perceived wellbeing when unable to exercise, and the psychological need to continue excessive physical activity at the expense of physical health, social responsibilities, etc. Those who engage in endurance sports are at greater risk not only because the culture of those activities encourages pushing the body to its limits, but also because those activities serve as an outlet for individuals already using exercise as a coping mechanism or who are attracted to the properties that make it addictive. Organized sports serve as a "safe haven" for PE, as repeated injury, exhausting practices, and unhealthy body compositions are often accepted without question. One aim of our research[7] was to shed light on its psychological underpinnings as addictive or compulsive. We also hoped to provide more accurate prevalence estimates for the general adult population, as well as estimates by gender and by specific ED diagnosis.

We administered six previously validated measures assessing various conceptualizations of PE[7] and one measure of disordered eating, the Eating Disorder Examination-Questionnaire (EDE-Q)[8] to a sample of 625 adult participants representative of the general population as well as to a sample of 872 athletes and avid exercisers. Our results suggest that the prevalence of PE in the general population may be as high as 6.4%, with a 5% prevalence estimate for secondary PE and 1.4% for primary PE.

Certain characteristics seem to increase patients' risk for PE. For example, 14.6% of those with significant ED symptomatology may also have PE, and risk was highest in those with bulimia nervosa (BN). Additionally, it appears secondary PE more closely resembles a compulsion than an addiction. Overall, however, addiction and compulsion measures were strongly correlated with one another, suggesting motivation for excessive exercise may be conceived as both addictive and compulsive to varying degrees.

Athletes are at even greater risk than those with an ED, with 18.6% classified with PE versus 9.8% of non-athletes in our entire sample ($\chi^2[1] = 21.1$, $p < .001$). The measures assessed maladaptive thought processes surrounding exercise rather than exercise frequency or intensity alone. Thus, these results cannot be explained away by two-a-day practices. Interestingly, risk for developing PE does not differ significantly by gender, although females are more likely to display PE features in the context of an ED while males are more likely to have primary PE. Women scored higher on measures of compulsion while men scored higher on measures of addiction, suggesting that females are more likely to exercise compulsively in an effort to lose weight or manage anxiety, while males have a more addictive PE profile. It should be recognized, however, that body modification may be a motive for many males but was simply not captured by the questionnaires used in this study. This was supported by a prospective British study examining risk factors for compulsive exercise in adolescents, which not only reaffirmed the role of media pressure to be thin in the development of compulsive exercise in girls, but also found that family and peer messages to become more muscular predicted compulsive exercise in boys.[9]

Although our research examined PE in the adult population, childhood and adolescence are critical periods during which coping mechanisms and self-concept are developed, healthy and unhealthy habits are formed and solidified, and engagement in physical activity through organized sports or other means is (rightfully) encouraged. The relatively few studies of younger populations further validate our concerns regarding this age group. One Italian study including 2,853 high schoolers iden-

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tified "exercise addiction" in 8.5% and noted significant correlations with other compulsive and addictive behaviors.[10] Researchers in Denmark developed a youth version of the Eating Addiction Inventory and reported a prevalence of 5.5% in adolescent athletes and 21.2% in patients with an ED among 452 participants aged 11-20 years.[11]

How can you use this information to help young patients? The first step is recognizing that PE exists and can have a profound negative impact on your patients' lives. Our results dispel the misconception that females with EDs are the only demographic with maladaptive exercise behaviors. If an adolescent boy mentions his commitment to working out, frustration with repeated injuries, or slipping grades and other abandoned activities, do not assume such attitudes and behavior are normal given his gender. Similarly, if a young lady presents with a very thin body habitus, do not feel relieved when you discover she is a cross-country runner, swimmer, or soccer player. PE can present in many forms: as compulsive or addictive, across genders, and alone or in conjunction with an ED. As with the diagnosis of any condition, societal norms and biases should be recognized and put aside to provide the best care for all patients. Physicians are not immune to having their own biases.

Unfortunately, it appears there is no single measure that can reliably identify PE, as only 41% of those with PE in our study scored high in more than one measure. You are thus tasked with the challenge of identifying potential red flags that could signal a maladaptive relationship with exercise: exercise with increasing frequency, duration, or intensity that takes priority over other activities and responsibilities; negative emotional or physical symptoms when unable to exercise; continuing to exercise despite injury or other contraindications; and exercising to modify a distorted body image. As with most important issues, young patients will not present you with this information without pointed questioning or collateral input. It is imperative to ask specifically about their *relationship* with exercise. How important is exercise? Why do they exercise? How do they exercise? What happens if they are unable to exercise? Asking a few simple questions will help you determine whether further discussion or intervention is warranted. Additionally, preventative steps should be taken with children and adolescents to address unhealthy messages surrounding physical appearance that are projected through various forms of media. Discuss the negative impact that media can have on body image with both children and parents; encourage parents to limit exposure as much as possible and talk with their children about the importance of health and other personal attributes over attaining a particular body composition. While it is important to encourage moderate physical activity given the current obesity epidemic, other coping skills should be fostered and family-based treatment (FBT) or cognitive-behavioral therapy (CBT) implemented when appropriate.

While the knowledge base on PE is growing exponentially, evidence supporting treatment modalities specific to PE is lacking. To date, there have been no randomized controlled trials examining treatment for primary PE. Thus, physicians and therapists must rely on addiction principles, encouraging abstinence or harm reduction. Standards of care are more clearly defined for patients with secondary PE, as there are many evidence-based treatments to address their underlying ED.[12] FBT and CBT are currently viewed as the most effective modalities and can be tailored to encompass exercise behavior. Patients with anorexia nervosa (AN) should drastically reduce or eliminate exercise until weight is restored. Similarly, those with BN should minimize or eliminate exercise until they significantly reduce or stop their purging behavior,

as excessive exercise can contribute to the devastating cardiac consequences that result from electrolyte imbalances associated with this condition.

It is essential to fully understand patients' motives to exercise in order to address maladaptive attitudes and cognitions, and to also treat any aggravating comorbid psychiatric illness, such as anxiety or depression. It should be noted that selective serotonin reuptake inhibitors (SSRIs) are not effective in the treatment of AN, as weight restoration must occur before SSRIs will produce their desired effects. Thus, other treatment modalities, such as FBT, CBT, inpatient re-feeding, and/or olanzapine, should be utilized in patients who are severely underweight.[13,14] Treatment for PE is far from straightforward, and a full discussion of the nuances and unknowns is beyond the scope of this article. However, while the steps to recovery are not crystal clear, recognizing that excessive exercise can be problematic and may require intervention is a great place to start.

### Take Home Summary

- Pathological exercise (PE) is an unhealthy relationship with exercise that, like other addictions or compulsions, profoundly impacts physical and mental wellbeing. It may be associated with an eating disorder or present independently.
- Our research suggests 6.4% of the general adult population and 18.6% of athletes may suffer from PE, and other studies report similar prevalence rates among adolescents, yet it remains largely unrecognized and undertreated.
- Given the prevalence of sports participation and eating and related disorders in the child and adolescent population, it is important that those caring for them recognize PE and intervene early to prevent the development of eating disorders and to restore global functioning and wellbeing.

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***Disclosure:*** Dr. Brewerton and Ms. Cunningham report no biomedical financial interests or potential conflicts of interest.

This research was funded by Furman University through the Furman Advantage Fellowship. Furman University had no role in the study design, collection, analysis, writing, or decision to submit the current article or the one referenced above. The original research was approved by the Furman University Institutional Review Board.