

## **Anorexia Nervosa: Starvation of Body and Mind**

By Melissa Lavoie

To be among patients with severe anorexia is to be surrounded by a barely contained physical energy. I spent a month on an inpatient eating disorder service as a medical student, and attended the daily group therapy sessions. Patients would sit in a circle with their legs shaking, cores tightened, and arms tensed and coiled above their heads. I noticed the jittery legs first: on some days nearly everyone had a foot on the ground, tapping incessantly. This behavior proved so common that the facilitator developed a system for alerting patients to the problematic motion. First she tapped her palm on her thigh. If it continued, she told the patient to stop.

The leg jiggling was a recurring issue. A patient, who had managed to control her own leg movements, declared one day in group: *It is really triggering when I see other people in here shake their legs. Please, please help me in my recovery by stopping.* Despite pressure from both facilitator and peers, some patients returned again and again to the behavior. Anorexia, as I understood it from these experiences, involved an inexorable urge to *move*.

The reason for the leg shaking was simple, I thought. These patients all wanted to burn calories. This was a weight loss strategy, yet another conscious manifestation of the drive to reduce net energy intake at all costs. I was so certain of this that I never asked about it, never considered another explanation for the constant movement.

I had always thought of anorexia nervosa as a disease process arising in the mind and ending in the body. First came the disordered thoughts: the body dissatisfaction, fear of fatness, and preoccupation with food. Those thoughts drove the restrictive behaviors that characterize anorexia, like rigid dieting and excessive exercising. I placed the leg shaking in this category. Left unchecked, these behaviors led to a malnourished body, susceptible to low blood pressure, osteopenic fractures, a host of other physical ailments, and at worst, life-threatening cardiac arrhythmias.

Many patients on the eating disorder service could readily identify the circumstances and thoughts surrounding their earliest dieting behaviors. One patient traced her eating disorder back to a difficult pregnancy. Another cited her experience on a sports team in junior high. These patients had spent countless hours in therapy delving into the roots of these disordered thoughts, into their family dynamics, life experiences, and ideas about weight.

Given my understanding of anorexia as a cause-and-effect chain leading from thoughts to behaviors and finally to body, it seemed to me that long-term recovery needed to target the source: the thoughts. This is not a novel idea. Psychodynamic psychotherapy, one of the most common therapeutic modalities, rests on the similar but more broadly applied premise that gaining insight into how a patient's past shapes her present alleviates suffering and improves quality of life.

Yet what struck me as I came to know the patients on the service was how far their eating disorders had strayed from the initial triggers. I thought of our patient with the challenging pregnancy. While she could name it as the time she first became preoccupied with weight, nearly two decades had passed. Her anorexia had ebbed and flowed in the intervening years, and she rarely brought up her pregnancy any longer. It was as if her anorexia had taken on a life of its own. Her eating disorder may have started with the pregnancy, but the two diverged long ago.

My earliest understanding of anorexia grew out of an amalgam of cultural narratives. Writer Katy Waldman describes a few of these narratives in her personal essay for *Slate*.<sup>1</sup> Some are laughable today, like the notion that it represents a fear of pregnancy, in which a young woman views food as an "impregnating agent".<sup>2</sup> However, others still feel startlingly relevant to the dialogue around eating disorders.

One enduring narrative conceptualizes anorexia as a problem of family dynamics. Psychiatrist Salvador Minuchin played a critical role in advancing this theory in the 1970s. He argued that the disorder preserved family harmony by drawing attention away from the parents' personality vulnerabilities and marital discord. He blamed certain parental types – in particular, an overbearing mother and distant father – as contributing to the development of anorexia.<sup>3</sup>

The family theory of anorexia is neither entirely wrong nor entirely right. As Waldman points out, observational studies have found evidence of dysfunctional parent-child interactions in families with teenagers suffering from anorexia.<sup>4</sup> However, Minuchin's ideas are deeply flawed. They are rooted in sexist tropes, and it remains difficult to untangle correlation and causation. Do problematic family

---

<sup>1</sup> Katy Waldman, "There Once Was a Girl: Against the False Narratives of Anorexia," *Slate*, Dec. 7, 2015, [http://www.slate.com/articles/double\\_x/cover\\_story/2015/12/we\\_need\\_to\\_reject\\_the\\_false\\_narratives\\_around\\_anorexia.html](http://www.slate.com/articles/double_x/cover_story/2015/12/we_need_to_reject_the_false_narratives_around_anorexia.html).

<sup>2</sup> Waldman.

<sup>3</sup> Ely Kog and Walter Vandereycken, "Family Characteristics of Anorexia and Bulimia: A Review of the Research Literature," *Clinical Psychology Review*, 5(2) (1985): 159-180.

<sup>4</sup> Caroline Blair, C Freeman, and A Cull, "The Families of Anorexia Nervosa and Cystic Fibrosis Patients," *Psychological Medicine*, 25(5) (1995): 985-993.

dynamics cause eating disorders, or do eating disorders breed conflict and tension within a family?

Another narrative that shaped my understanding of anorexia was the notion of the disorder as a response to societal pressure. I went to an all-girls junior high, one where we learned about unrealistic body expectations and their toxic impact. We learned that Barbie dolls were anatomically impossible, with waists too slender to ever exist in real life. We learned that anorexia comes from being bombarded by these images every day, by the airbrushed magazine covers and rail-thin runway models.

This concept of anorexia appealed to me, as a feminist. It still does. Yet like the family dynamic theory of anorexia, it fails to explain why the disorder persists long after the initial trigger has lost its power. These ideas reflect aspects of our world that are real. Yet they remain simplistic, forcing the complexity of anorexia into the confines of our cultural moment.

These narratives share a missing link – the same link I missed when I arrived on the eating disorder service. They all fail to take into account the profound impact of malnutrition on the brain. A growing body of evidence suggests that the neurobiological effects of starvation play a critical role in sustaining eating disorder behaviors. In contrast to the cultural narratives of anorexia that focus on external factors, this research shows that it is valuable to shift our gaze inward as well, and to consider how severe malnutrition shapes mental life.

A compelling body of evidence suggests that starvation worsens eating disorder symptoms. The Minnesota Starvation Study, led by physiologist Ancel Keyes in 1944-45, remains one of the most detailed investigations into the effects of malnutrition on thoughts and behavior. As participants lost up to a quarter of their body weight while on a calorie-restricted diet, they exhibited a host of behaviors typically seen in anorexia. They developed perceptual disturbances relating to body size, viewing themselves as fat and overestimating the width of their own faces.<sup>5</sup> They became preoccupied with food, engaged in complex food rituals, and withdrew socially.<sup>6</sup> Keyes wrote: “As starvation progressed, the number of men who toyed with their food increased... Toward the end of starvation some of the men would dawdle for almost two hours after a meal which previously they would have

---

<sup>5</sup> Leah Kalm and Richard Semba, “They Starved So That Others Be Better Fed: Remembering Ancel Keys and the Minnesota Experiment,” *Journal of Nutrition*, 135(6) (1995): 1347-1352.

<sup>6</sup> Kalm and Semba.

consumed in a matter of minutes...”<sup>7</sup> These starved young men, with no history of eating disorders, sounded exactly like my patients on the eating disorder service.

Researchers have found similar behaviors in rats and mice subjected to restricted feeding schedules. In one study, rats on a restricted diet paradoxically showed reduced food intake and a nearly three-fold increase in physical activity.<sup>8</sup> Common sense might suggest that the rats would slow down and eat more to conserve energy, but they did the opposite. Further research has replicated these findings.<sup>9,10</sup> These studies have also examined the role various neurological signaling molecules, such as leptin and dopamine, might play in anorexia-induced hyperactivity.

My patients on the eating disorder service seemed so similar in certain ways. They had varied life experiences and illness trajectories, but nearly all manifested the disorder in an identical way: through compulsive leg shaking. The uniformity was striking. As I look back, I wonder if the excess movement was not a deliberate weight loss strategy as I had thought, but was instead driven by starvation.

Anorexia, then, is more than a product of thoughts. I once understood it as a unidirectional disease process, but now think of it as more akin to a cycle. A trigger – a genetic predisposition, a particular social milieu, or something else entirely – gives rise to the earliest eating disorder behaviors. Yet at a point, the anorexia begets itself. Malnutrition begins to drive the dieting and the exercising in ways even the sufferer may not perceive.

The interplay between mental life and physical illness in anorexia carries critical implications for how we think about and treat the disorder. It reinforces the importance of training psychiatrists well versed in caring not only for the mind, but the body. Few eating disorder treatment programs will accept the most malnourished patients, instead taking them only after they have been medically stabilized elsewhere. However, the most underweight patients are also those with the most profoundly impaired thinking, with perhaps the greatest need for integrated psychiatric and medical care.

This also highlights the centrality of weight restoration in anorexia treatment. Psychodynamic therapy and other insight-oriented therapies, while potentially

---

<sup>7</sup> Ancel Keys, Josef Brozek, Austin Henschel, Olaf Mickelsen, and Henry Longstreet Taylor, *The Biology of Human Starvation* (Minneapolis, MN: The University of Minnesota Press, 1950), 832-834.

<sup>8</sup> Martien Kas, Gertjan van Dijk, Antonius Scheurink, and Roger Adan, “Agouti-Related Protein Prevents Self-Starvation,” *Molecular Psychiatry*, 8(2) (2003): 235-240.

<sup>9</sup> Cigdem Gelegen et al., “Dopaminergic and Brain-Derived Neurotrophic Factor Signalling in Inbred Mice Exposed to a Restricted Feeding Schedule,” *Genes, Brain and Behavior*, 7(5) (2008): 552-559.

<sup>10</sup> Cigdem Gelegen et al., “Difference in Susceptibility to Activity-Based Anorexia in Two Inbred Strains of Mice,” *European Neuropsychopharmacology*, 17(3) (2007): 199-205.

valuable, cannot fully address thoughts distorted by starvation. Because weight gain improves insight and judgment relating to food, mental health providers should not postpone refeeding until the patient feels ready. As hard as it may be for the patient to imagine in an undernourished state, weight gain can help her feel better and think more clearly.

Lastly, thinking deeply about how physical illness impacts thoughts and behaviors in anorexia is crucial for moving past the myths that have held back our understanding of the disorder. We want to attribute anorexia to things we can see and understand, like misguided parents or lithe celebrities splashed on the covers of magazines. While these narratives contain elements of truth, they all raise the question of who deserves blame. Is it the overbearing mother, the exacting gymnastics coach, or the toxic friend group? Or does the teenager with anorexia just need to work on her perfectionism?

Acknowledging the way starvation worsens anorexia allows for a more nuanced view of the illness and leads us away from questions of fault. Anorexia lies at the intersection of body and mind, and contains elements of both biology and choice. When I noticed the leg shaking, I thought of it as *just a choice*. Yet it was more than *just a choice* – it was a behavior driven by complex neurobiological pathways we are barely beginning to understand. While psychosocial factors might contribute to anorexia, malnutrition only makes it worse. Realizing that the neurobiology of starvation is no one's fault, I am more empowered to approach my future patients and their families with understanding and acceptance.