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Undergraduate

EATING DISORDERS: THE BODY WASTING AWAY

Shirley Shao

When the girl goes to lunch with her friends, she orders a sandwich. She eats all of it, and then later, in the bathroom, she vomits up and flushes it down the toilet. In another case, she eats none of it, and when her friends are not looking, she throws it away in the trash. Or perhaps she does not buy the sandwich at all, saying that she already ate - or maybe she takes tiny bites as she and her friends talk, secretly spitting out what her teeth chewed into mush into a napkin. In fact, she may not be a girl at all, but it is probable that she is, and that she comes from the middle class. This could be the first time she has done this, or this could be just one of many recurring episodes - but if she has just began to walk down this road, she is most likely somewhere from age 15 - 19 (Fairburn, 2003). There are many flavors to an eating disorder, and what the girl displays is only a sampling of the possible variations. It is easy to see the waste in eating, regurgitating, and then flushing a box of Cheez-its down the toilet, or in tossing untouched food aside. But even if the stomach never gets to break down the proteins in that skipped dinner, something else is disintegrating and slowly wasting away.

That something is the body and mind.

The medical diagnosis for these disorders can be roughly sketched to divide eating disorders into three categories: anorexia nervosa, bulimia nervosa, and atypical. Anorexia nervosa, colloquially referred to as anorexia, is one of the most well known and has the most apparent physical symptoms. It is also one of the better understood, having been the subject of more studies than most of the other disorders. Anorexic patients are notably underweight and engage in long-term, severe restriction of their food intake; in addition, they often have difficulty sleeping and experience lethargy. In a sense, anorexia involves the consequences of self-induced starvation. Food and an anorexic's restriction of it becomes an obsession as they seek to control their body, an obsession that grows into a feeling of pride when they are faced with their thinness or low weight. This pride, in turn, nurtures the perception that their eating habits (or lack thereof) are accomplishments rather than a sign that they need help (Fairburn, 2003). There is even



a "pro-ana" movement where its members search for self-improvement for their imperfect selves, in this case embracing the restraints and dramatic weight loss embodied in anorexia (Bates, 2015).

Such perceptions are dangerous in a world where an anorexic is more likely to die than a patient afflicted with any other psychiatric disorder, both because of the risk of suicide and as a result of medical complications (Fairburn, 2003). A 2011 study by Jon Arcelus revealed that the SMR (standard



Figure #1. Oftentimes, patients with eating disorders have a distorted view of what their body looks like, and will resort to purges or fasts in order to achieve the weight they desire.

mortality) rate of anorexics is 5.86. As a means of comparison, schizophrenia has a SMR of 2.5 for females and 2.8 for males. For bipolar disorders, males have an SNR of 1.9 and females 2.1 (Arcelus, 2011). Here, SMR refers to the incidence rate of death over a decade.

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The other major well-known eating disorder is bulimia nervosa, colloquially referred to as bulimia. This is more common than anorexia and typically has a later age of onset, and is punctuated by periodic binges and purges. Here, purges can refer to the regurgitation of food or obsessive exercise that is intended to “purge” the body of the calories ingested,

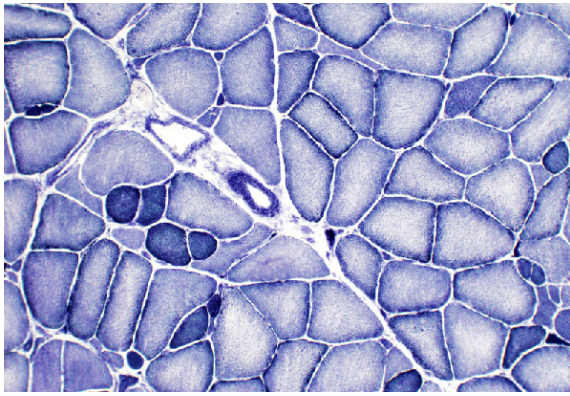


Figure #2. The type 1 fibers have been dyed a darker blue. In a healthy cell, type 2 fibers are not smaller than type 1 fibers. In anorexics (tissue sample not depicted), the type 2 fibers have atrophied to become much less prominent than type 1 fibers.

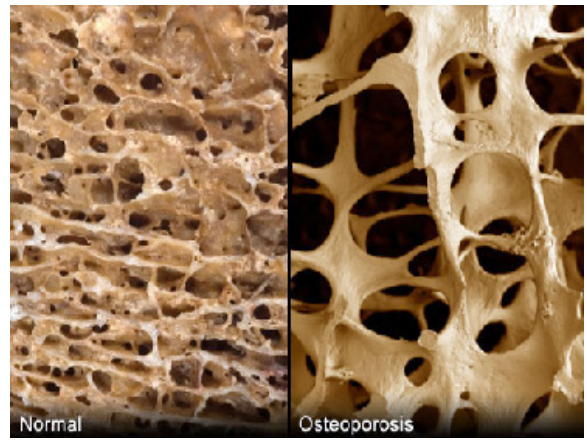


Figure #3. Because of nutrient deficiencies, anorexics and other patients afflicted with eating disorders will suffer a decrease in bone mass density. This puts them at risk for osteoporosis.

while bingeing refers to an single sitting where the patient eats continuously. Because the purges and binges balance each other out, a bulimic generally has a less emaciated or markedly thin appearance than does an anorexic. The third category of eating disorders consists of “atypical disorders,” which, when combined form the largest category of eating disorders. They involve variations on the better-known disorders, but are made unusual with deviations that prevent identification within the two other established categories (Fairburn, 2003).

The reality of the impact self-starvation has on the body is grim. When a patient’s “purging” of a patient involves vomiting, the consequences can manifest in his or her mouth. The vomit can cause dental erosion and undermined tooth enamel, at the same time wearing down the contours of the teeth. In these cases, formerly glossy teeth become worn down and uncomfortably sensitive to touch and temperature changes. Other effects include (but are certainly not limited to) damaged mucosal membranes in the mouth and pharynx, and lesions in oral tissue (DeBates, 2004).

In one study by C.F. Lindboe, women from age 19-28, who had struggled with anorexia for an extended period of time, allowed scientists to take a sample from the vastus lateralis of their quadriceps femoris muscle, which is a prominent muscle in the upper leg. Within muscle fibers, there are two main types – namely, type 1 and type 2. Type 1 fibers are “slow-twitch” fibers that are involved in continuous extended muscle contractions, say, those that are needed for a cycling marathon. Type 2 fibers on the other hand, are “fast-twitch” fibers that are involved in shorter intervals of movement. Type 1 relies on oxygen, whereas type 2 can churn out energy using anaerobic respiration. For ordinary people, type 1 and type 2 fibers are the same length and size. In Lindboe’s study, the women had experienced 41%

weight loss, and both types of fibers have atrophied in the cells of the anorexic women: the type 1 fibers have degenerated by 41%, while the type 2 fibers have degenerated by 75%. These women had no history of neuromuscular disease, and the study implies that the complications of their anorexia that have inflicted this damage on their body. Such a theory is supported by other studies, where samples of muscle taken from boys and girls who had experienced pronounced weight loss (about 25%) were analyzed and found to also exhibit atrophied type 2 fibers (Lindboe, 1982). Beneath the skin, the muscles of the body are wasting away.

In these cases, an eating disorder sucks much-needed nutrients away from the body, and as the muscles decay, the bones do not escape unscathed either. They are the casualties of a damaged hormonal system. Depending on when the onset of an eating disorder is, the consequences on a patient’s body can vary. For anorexics whose body fat concentration has dipped below a certain level (the precise cut off varies with an individual’s body composition), amenorrhea, the absence of menstruation sets in, and with it, decreased bone mass. For a pre-pubescent girl, anorexia can delay the onset of puberty all together, and the implications of amenorrhea in a key time period of bone development are dangerous. The medley of hormones whose levels are forced to climb or drop because of nutritional deficiencies or the lack of a menstrual cycle is frightening long: FSH, estradiol, testosterone, cortisol, growth hormones, insulin-like growth factors, thyroid hormones, leptin, ghrelin, and peptide YY levels are all thrown into disarray by nutritional deficiencies. Of these, FSH, estradiol, testosterone, and growth hormones are related to the growth and development of the body, whereas the final three (leptin, ghrelin, and peptide YY) hint at the chaotic state of the factors that control a person’s appetite. For adults, these hormonal abnormalities can contribute to

“Beneath the skin, the muscles of the body are wasting away”

the development of osteoporosis, in which the bones become weak and fragile as they are riddled with increasingly larger holes (caused by bone loss or bone deficiencies). In particular, the hormonal anomalies induce increased bone resorption, as minerals of the bone are broken down and sent into the body. Bone resorption is not unseen in healthy bodies, but is drastically increased in starved bodies. In one study, 92% of the anorexic women had bone densities that were below average, with 38% exhibiting a bone density low enough that certain sites could be classified as osteoporotic. It is telling that the only known methods of restoring bone mass density are through weight gain and the end of amenorrhea (Lawson, 2003).

In a 2014 study by Carolina Bates, she researches the metaphors applied by anorexics on online communities, and titles her article “I am a Waste of Space, of Breath, of Time.” Although the paper describes an analysis of the mindsets of more extreme (and moreover, less covert) anorexics, the title alone gives some insight to the reason why eating disorders are psychiatric disorders. The affect of an eating disorder beyond the physical body are undeniable – as a patient becomes obsessed with the thought of food or weight control, they become less productive and their disorder can become an economic burden that increases health costs (Samnaliev, 2014). In this way, waste of the body extends to waste of the mind, branching over wasted time and talent. The psychological effects of a disease can be more difficult to measure than the physical, beyond the criteria for diagnosis. Both clinical and epidemiological studies show that most people with anorexia or bulimia are also burdened by another anxiety disorder, be it OCD or a social phobia (Kaye, 2004). Treatment is much easier when the disorder is discovered and addressed early on, but for people who have engaged in one for so long that the behavior has become entrenched, treatment becomes extremely difficult. The story of an anorexic, of a bulimic, of anyone afflicted with an eating disorder can begin with the waste of food, and end in the waste of human life.

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IMAGE SOURCES

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